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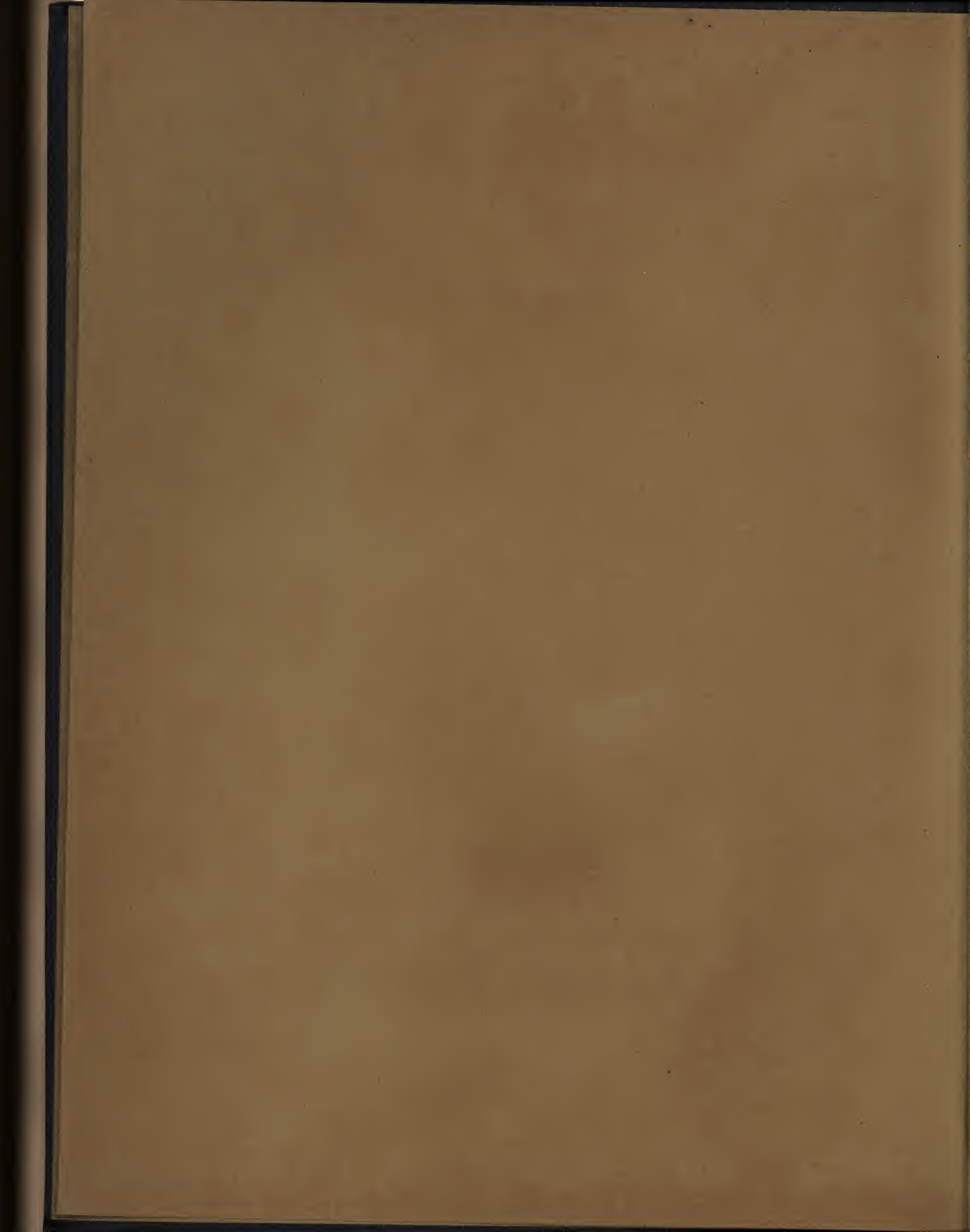
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Planning for
Home Telephone
Conveniences

For the use of
Architects - Engineers
Builders - Owners

Southern Bell Telephone & Telegraph Company

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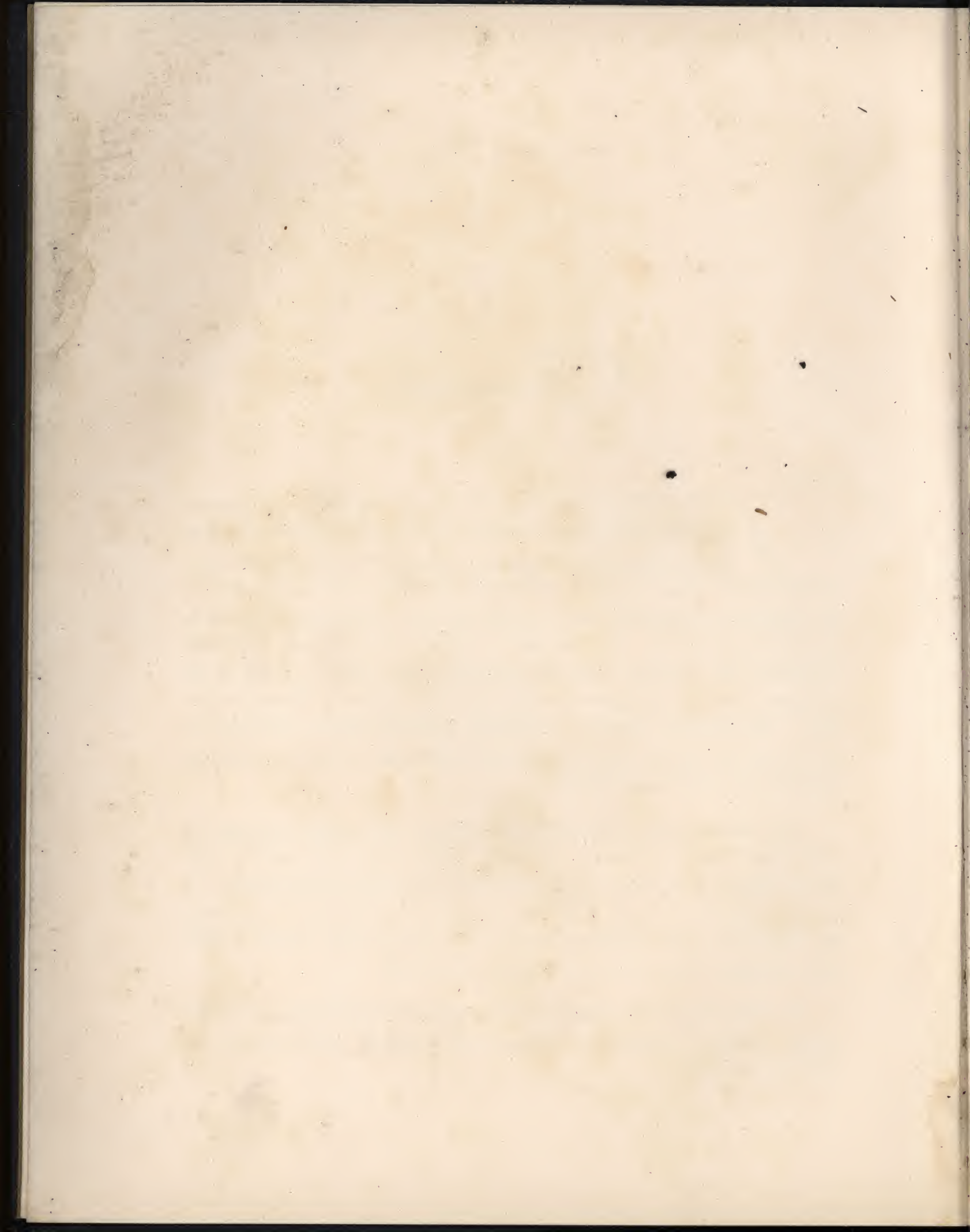
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Foreword

THE desirability of planning in advance for telephones in residences is generally recognized by architects, engineers and builders. The purpose of this booklet is to present information on this subject which will be helpful to those engaged in designing and building residences to the end that telephone arrangements may be readily provided commensurate with other household conveniences. It is intended as a guide to the provision of desirable facilities for the telephone wires and apparatus rather than as a guide in the selection of service arrangements, which have been shown for illustrative purposes. The telephone company is constantly studying matters concerning its service and the facilities related thereto and will be glad to make available any supplementary information desired.

Any business office of the telephone company will be glad to arrange for conferences between architects, engineers, builders and owners and the telephone company's engineers to discuss facilities for specific building projects. It is highly desirable, of course, that these matters be discussed prior to or during the preparation of the building plans so as to avoid possible changes in plans with consequent delay and inconvenience to the owner.

To those engaged in designing and constructing large buildings a similar booklet entitled "Planning for Telephones in Buildings" will be gladly furnished upon request.



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General

1. Scope. The placing of facilities for telephone wires and apparatus during construction results in general improvement of the residences in that better appearance is secured by concealing the wires and some of the apparatus; additional telephones when desired can readily be placed at convenient locations; protection is afforded to the wires and apparatus, thereby serving to prevent interruptions to the telephone service; and the service arrangements can be changed without marring the walls and woodwork.

With the growing appreciation on the part of telephone subscribers of the conveniences to be obtained from adequate telephone service a greater number of telephones is being installed in homes. It is, therefore, important that the facilities provided be adequate for all of the telephones that may be desired in the future as well as initially.

With the view of laying out the conduit and other facilities required to the best advantage the telephone company will be glad to cooperate with architects, engineers, builders and owners relative to desirable service arrangements for proposed residences. This consulting service of the telephone company is available without expense and should be particularly valuable to architects and others who are engaged in the design of plans and specifications for sale to home builders.

Conduits, protector cabinets, telephone cabinets or other arrangements for concealing the wires and apparatus are provided by the owner since these facilities, in common with water, gas and electric light conduits and fixtures must necessarily become a permanent part of the building.

It is, of course, impracticable to show all types of residences with the possible telephone arrangements for them. Therefore, the typical arrangements shown in this booklet should be considered only as indicative of the advantages to be obtained by planning in advance and providing the facilities for residence telephone service during construction.

Any business office of the telephone company will be glad to arrange for conferences between owners, architects, engineers and builders and the telephone company's engineers with reference to any phase of this matter.

2. Service Entrances. The usual method of connecting a residence telephone to the telephone company's plant is by means of exposed wires from a pole or other outside terminal location to the point of entrance. If the owner desires, and conditions permit, arrangements may be made whereby the telephone company will place its cable in an underground service conduit constructed and maintained at the owner's expense. In order to avoid misunderstandings and possible additional expense to the owner where an underground conduit is desired, owners or contractors should confer with the business office of the telephone company concerning the arrangements before completing plans for this type of service entrance.

To aid contractors in making underground service entrances the telephone company's "Specifications for Underground Service Entrances" are included as an Appendix. Contractors installing underground service entrances should give the telephone company at least 48 hours' advance notice before filling in the trench so that the company may have the work inspected and determine whether it meets the requirements for telephone service.

Overhead Service Entrances

3. Location of Entrances. Overhead entrances are made in the cellar or basement, except in residences not having cellars. In such cases entrances may be either under the first floor or through the attic but in either case arrangements must be made for mounting the telephone protector cabinet, as illustrated in Figure 3, so that it will be accessible from the outside of the building.

The location of the service entrance should permit as direct a route as possible for the wires from the telephone terminal to the entrance. Where the pole line from which connection will be made is in the rear of the property, service entrances will preferably be at the rear of the house. Where the pole line is in the front of the property, service entrances should be on the side of the house nearest the pole from which the wires will be run. Should there be any doubt as to the point from which the wires will run, the telephone company should be consulted before the service entrance is located.

4. Service Conduits for Telephone Wires. Conduit should be provided for running the telephone wires from the point of attachment on the house into the building. The telephone company will run its wires through this conduit as required.

Service conduits should conform to the following:

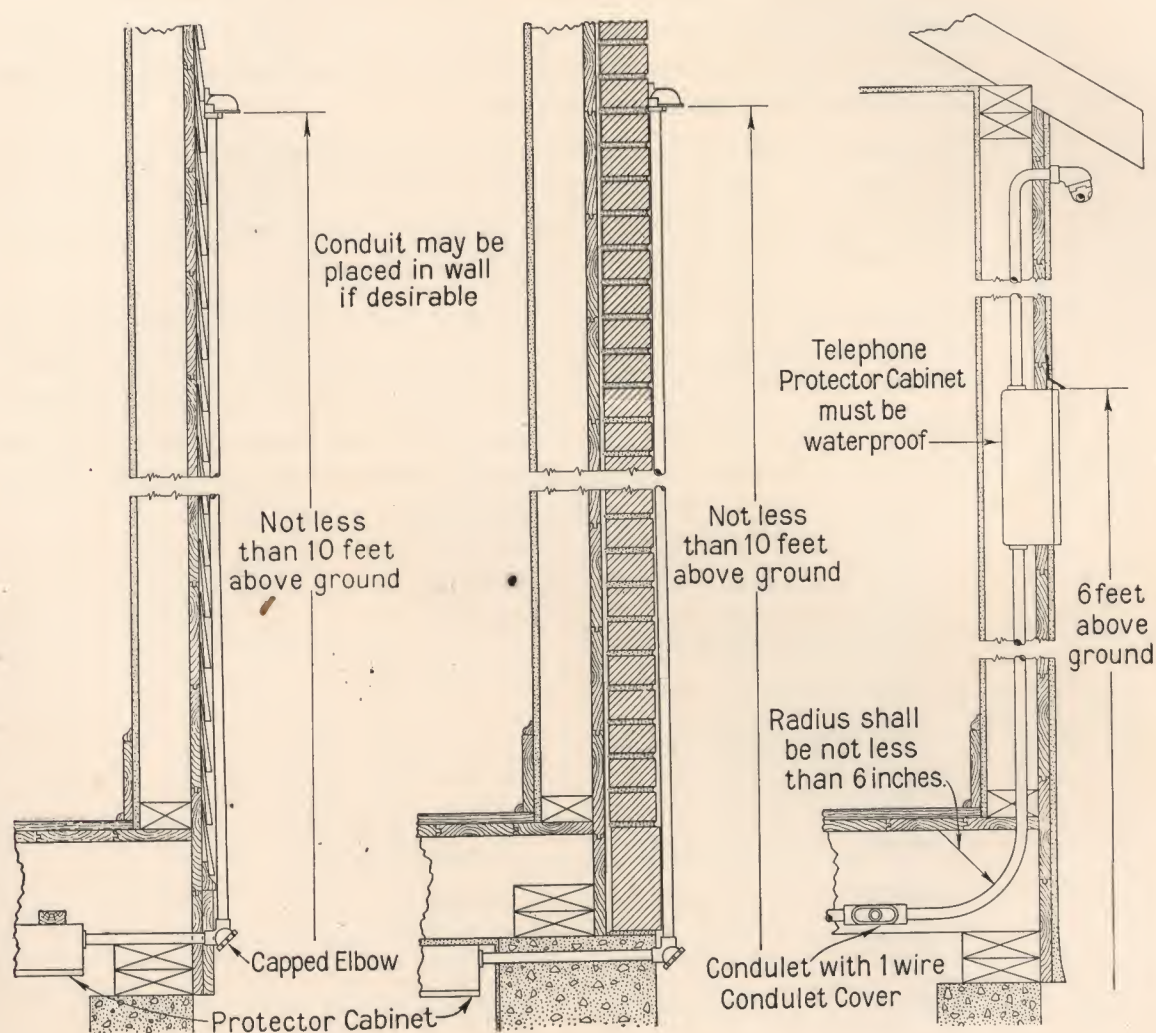
- (a) They should be of approved rigid iron conduit having an inside diameter of not less than $\frac{1}{2}$ inch for one pair of wires, $\frac{3}{4}$ inch for two pairs of wires and 1 inch for three and four pairs of wires. Ends of all conduits should be reamed.
- (b) They should be securely fastened to the building. Figures 1, 2 and 3 show typical installations of service conduit.
- (c) The upper end of the conduit should be not less than 10 feet from the ground and be protected by an approved service head. All conduits should be weatherproof.

Note: In some cases conditions may require conduit to extend more than 10 feet above the ground.

- (d) They should be permanently and effectively grounded according to the requirements of the National Electrical Code and any local requirements covering the grounding of service conduits.

PLANNING FOR HOME TELEPHONE CONVENIENCES

- (e) They should terminate in a protector cabinet placed in the cellar or basement (Figures 1 and 2) except in the case of residences not having cellars when the protector cabinet should be placed in the service conduit run as shown in Figure 3. See also Section 6.
- (f) There should be a clearance of not less than 6 inches between the telephone service conduit and the electric light service conduit.



Service conduits must be grounded

Figure 1.

Service Conduit with open cellar ceiling.

Figure 2.

Service Conduit with finished cellar ceiling.

Figure 3.

Service Conduit with no cellar under house.

Telephone Protector Cabinets

5. General. Most residences require a protector in the telephone line. It is desirable, therefore, that arrangements be made in connection with the service conduit for the telephone protector. This is accomplished by providing a metal cabinet of suitable size to which the service conduit and the conduit to the telephones are connected.

6. Locating Protector Cabinet. The protector cabinet should be located as close to the point of entrance as possible and in accordance with the following :

- (a) The entrance should be located in a clean, dry and ventilated place. Otherwise the presence of moisture will lower the insulation of the protectors and detract from satisfactory service.
- (b) The entrance should be at a point where the protector and wiring will not be subject to injury and where the protector will be accessible at all times. Coal or wood bins, storage rooms or rooms to which access is difficult should not be selected for the point of entrance.
- (c) The entrance shall not be in a transformer vault nor in a location where the telephone installers or repairmen or the telephone system will be subjected to contact with the live parts of electric light or power circuits or apparatus.

In bungalows or other residences not having cellars the protector cabinet should be placed in the wall as shown in Figure 3 or on the outside of the wall if the conduit is to be placed on the outside as shown in Figures 1 and 2.

7. Size of Protector Cabinets.

Number of Protectors*	Size of Protector Cabinets		
	A	B	C
1	4 inches	12 inches	8 inches
2	4 inches	12 inches	12 inches
3	4 inches	12 inches	16 inches
4	4 inches	12 inches	20 inches

*One protector is required for each telephone line. If more than four lines are required the telephone company should be consulted in regard to size of cabinet.

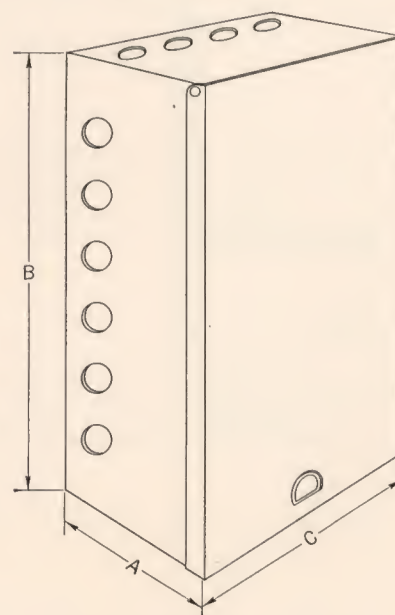
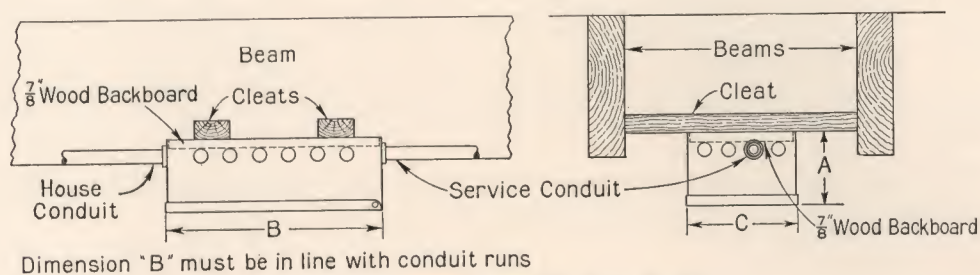
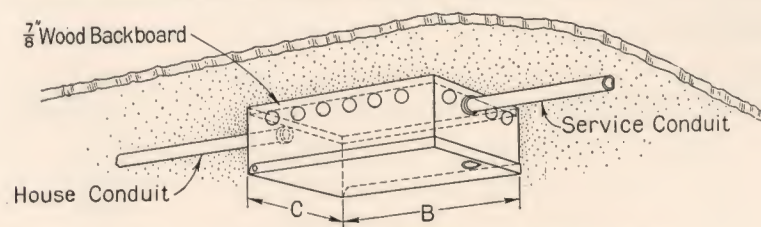


Figure 4.

8. Installing Protector Cabinets.

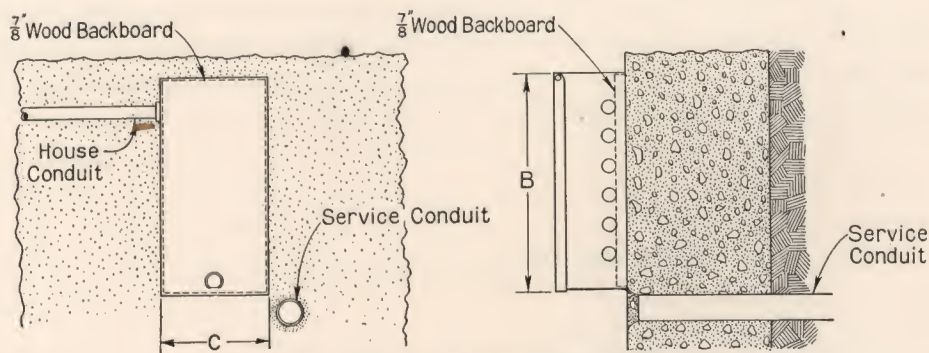


CABINET MOUNTED BETWEEN BEAMS



Dimension "B" must be in line with conduit runs

CABINET MOUNTED ON CEILING



Dimension "C" must be horizontal as shown
Place cabinet as close to entrance as possible

CABINET MOUNTED ON WALL

Figure 5.

Details for installing protector cabinets in outside walls (Figure 3) are usually furnished by the architect or builder to conform with the type of construction used in the residence. The cabinets should be of non-rusting material provided with hinged doors and so visored or arranged as to keep the protector, placed by the telephone company, dry at all times.

Conduit for Inside Telephone Wires

9. Iron Pipe Conduit. Separate iron pipe conduit run from the protector cabinets to the telephone locations should be installed in the same manner as required for electric light installations. Open ends should be plugged during construction of building to prevent the entrance of moisture or foreign material. Ends of conduit should be reamed.

After installation each conduit should be fished and provided with No. 14 galvanized iron pulling-in wire to facilitate the placing of the telephone wires.

10. Size of Conduit. For the average residence telephone service the following conduits are satisfactory:

<u>Pair or Triple Wire</u>	<u>Size of Conduit</u>
1	$\frac{1}{2}$ inch
2 and 3	$\frac{3}{4}$ inch
4	1 inch

When more than two 90 degree bends are necessary pull boxes should be installed so that no section will have more than two such bends. If sections exceed 50 feet the next larger size conduit should be used or pull boxes added so that no section between pull boxes will exceed 50 feet. No section of any size conduit should exceed 100 feet. For larger residences where cable may be required the telephone company should be consulted relative to the conduit required.

Telephone Locations

11. Telephone Locations. In order to install the conduits for telephone wires while residences are under construction, it is necessary that the locations of the outlets be determined in advance.

The modern family desires a modern home, so arranged and so fitted as to provide a maximum of labor-saving, time-saving and patience-saving equipment. Telephone arrangements in homes play an important part in social and domestic life and should clearly be comparable in comfort and convenience with the other household appointments to which the occupants are accustomed.

The telephones and related facilities should be sufficient in number and their locations such as to bring about the greatest comfort and convenience in the use of the service for both making and answering calls, and, in the larger homes, for inter-communication between telephones on the premises. It is desirable that the conduit

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layout installed be sufficient not only for the immediate but also for the ultimate telephone service. An additional margin in the number of telephone outlets lends flexibility in making any rearrangements in, or additions to, the service which the occupant may wish at any time. It also obviates the necessity of exposed wiring frequently necessary, where adequate outlets were not provided when the house was built.

In addition to the foregoing, the following factors have a bearing on the telephone service plans for any given residence.

The first floor should have at least one conveniently located telephone to serve the living quarters (the living room, sun porch, dining room, reception hall, etc.) and one telephone in or near the kitchen for convenience in promptly answering incoming calls and in conducting household affairs. It is highly desirable that the sleeping quarters be adequately provided with telephone service both for its general convenience and its necessity in case of sickness, alarm, and other emergencies. Each regularly occupied bedroom and guest room might well be provided with a telephone.

Telephones should also be readily available to servants' rooms, and if these are located on the third floor, a telephone should be placed there to insure the receipt of all incoming calls especially when the family is not at home. A telephone in the basement is most convenient, especially when a billiard room, amateur work shop (for radio, photography, etc.) or similar room is located there.

Figures 6 to 15 illustrate typical telephone locations in accordance with the above considerations. They give examples of the number and locations of telephones that should be provided in the interest of comfort and convenience and to meet the personal desires of occupants. Specific conditions in a given home—the number and age of the people comprising the family, the presence or absence of servants' quarters, the economic status and social activity of the family, the location of furniture, and perhaps others—may naturally modify the general arrangements shown. These conditions are always subject to change, particularly with a change in the occupants of the house, thus making the provision of sufficient flexibility in the conduit layout very important. In the interest of the greatest comfort and convenience it seems that one downstairs telephone should usually be located in the living room. It may be, however, that in some cases the hall location would be preferred. The examples shown recognize both locations.

The telephone company will be glad to consult with architects, builders and home owners concerning the location of telephones and the variety of services which are available to meet differing household communication requirements. It may be advisable, for example, to consider the use of additional telephone lines, additional bells, push buttons and switches for intercommunication between the telephones, portable telephones for plugging into jacks located at appropriate places, and many other related convenience facilities. In these, and probably other matters, the advisory services of the telephone company may be helpful. A call to the telephone company business office will insure the prompt receipt of such services.

Single Family Residences

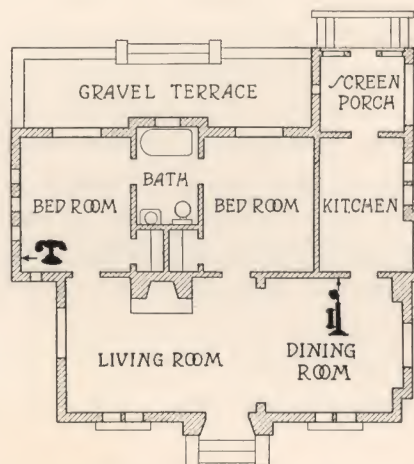


Figure 6.

Telephones in the dining room and the master bedroom.

The dining room telephone, because of its central location, is convenient for use not only in the room in which it is located, but also from the living room and kitchen; the bedroom telephone is immediately accessible to the occupants at night and may also be used by members of the family at other times when privacy of conversation is desired.

PLANNING FOR HOME TELEPHONE CONVENIENCES

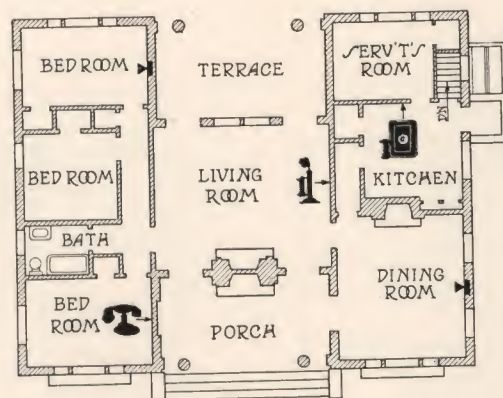
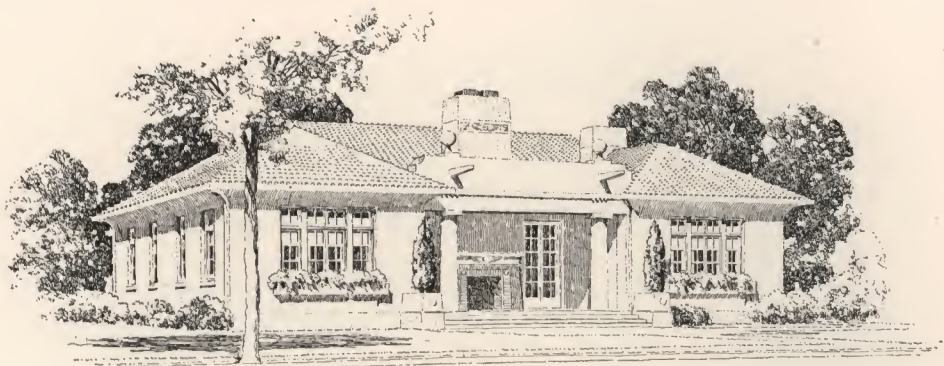


Figure 7.

Telephones in the living room, the front bedroom and the kitchen.
Additional telephone outlets in the rear bedroom
and the dining room are suggested.

The living room telephone is in a convenient location for comfortable day and evening use; the bedroom telephone is readily available in case of sickness, alarm, or other emergency situations at night; the kitchen telephone permits prompt answering of incoming calls and is useful in the conduct of the household affairs, such as marketing.

The other telephone outlets are suggested in the interest of greater comfort and flexibility in the telephone arrangements. They provide alternate or additional locations for telephones if and when desired. By locating telephone jacks at these places, for use with a portable telephone, service could be provided in the rear bedroom when it was occupied by guests, or in the dining room, which would make possible a certain amount of privacy in conversation when the living room was occupied by others.

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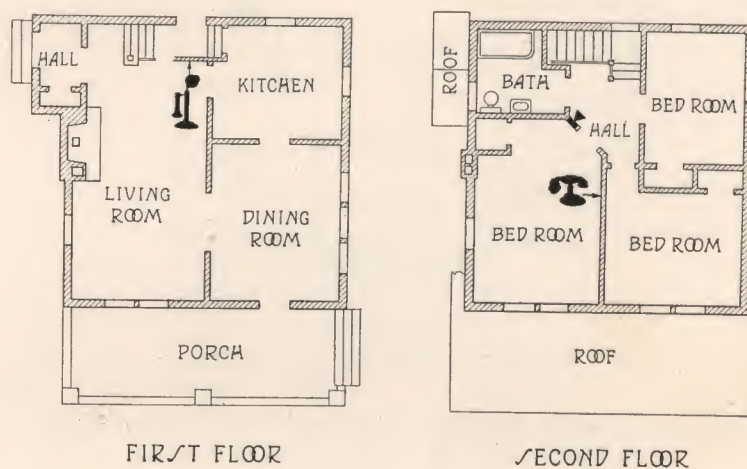


Figure 8.

Telephones in the living room and the large bedroom. An additional telephone outlet in the upstairs hall is suggested.

The living room telephone is well located with respect to the entire first floor and is convenient to the kitchen; the bedroom telephone is necessary for answering and initiating calls on the second floor, especially at night in cases of emergency.

An additional telephone outlet in the upstairs hall may be desirable for the installation of a telephone at that point. It also provides an alternate location for the upstairs telephone.

PLANNING FOR HOME TELEPHONE CONVENIENCES

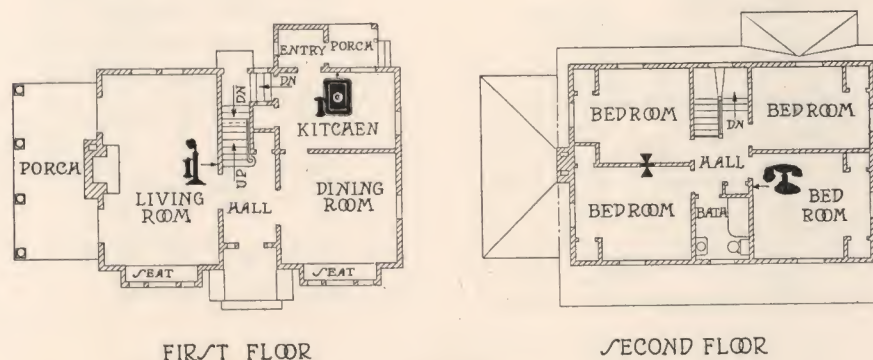


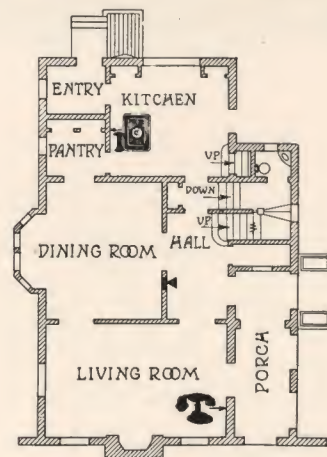
Figure 9.

Telephones in the living room, the kitchen and one of the bedrooms. Additional telephone outlets in the two other bedrooms are suggested.

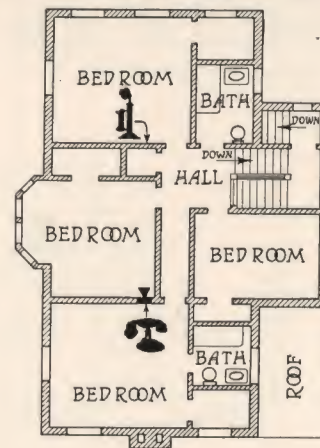
The telephone in the living room is located with a view to comfortable and convenient use; the kitchen telephone will prove a great convenience in conducting household business, such as marketing, and for answering incoming calls; the bedroom telephone is accessible for incidental daytime use and will be especially valuable to the occupant at night. Although not indicated in the plans, a telephone located in the basement may very often prove very convenient since it may prevent the loss of incoming calls and save many needless steps.

Two additional telephone outlets are suggested for the second floor because of the possibility that these rooms may be occupied by members of the family or guests, in which case it may be desirable to have telephones installed in them. If the owner should occupy the left-hand front bedroom, the telephone outlet in that room permits easily provided telephone service.

PLANNING FOR HOME TELEPHONE CONVENIENCES



FIRST FLOOR



SECOND FLOOR

Figure 10.

Telephones in the living room, the kitchen and the front and rear bedrooms. Additional telephone outlets in the downstairs hall and in one of the remaining two bedrooms are suggested.

The living room location for one of the downstairs telephones is selected because of the arrangements for comfortable usage which living rooms generally provide, and also because of its accessibility to the dining room and porch; the kitchen telephone, being at the opposite end of the house, provides a balanced arrangement and adds to the convenience of the downstairs telephone service; the telephone in the master bedroom affords a sense of security in night emergency situations, in addition to its other uses; the telephone in the rear bedroom will be advantageous when it is occupied by guests or in case it is permanently occupied, especially by an elderly person or an invalid. Presumably, in a home of this type, many household appliances are located in the basement, where an additional telephone might well be located for convenience since it would save many steps.

It is suggested that one additional bedroom be provided with a telephone outlet in order that additional telephone comfort and flexibility may be provided with ease when desired. A telephone outlet is also suggested in the downstairs hall for use in case it is desired to locate the living quarters telephone there.

PLANNING FOR HOME TELEPHONE CONVENIENCES

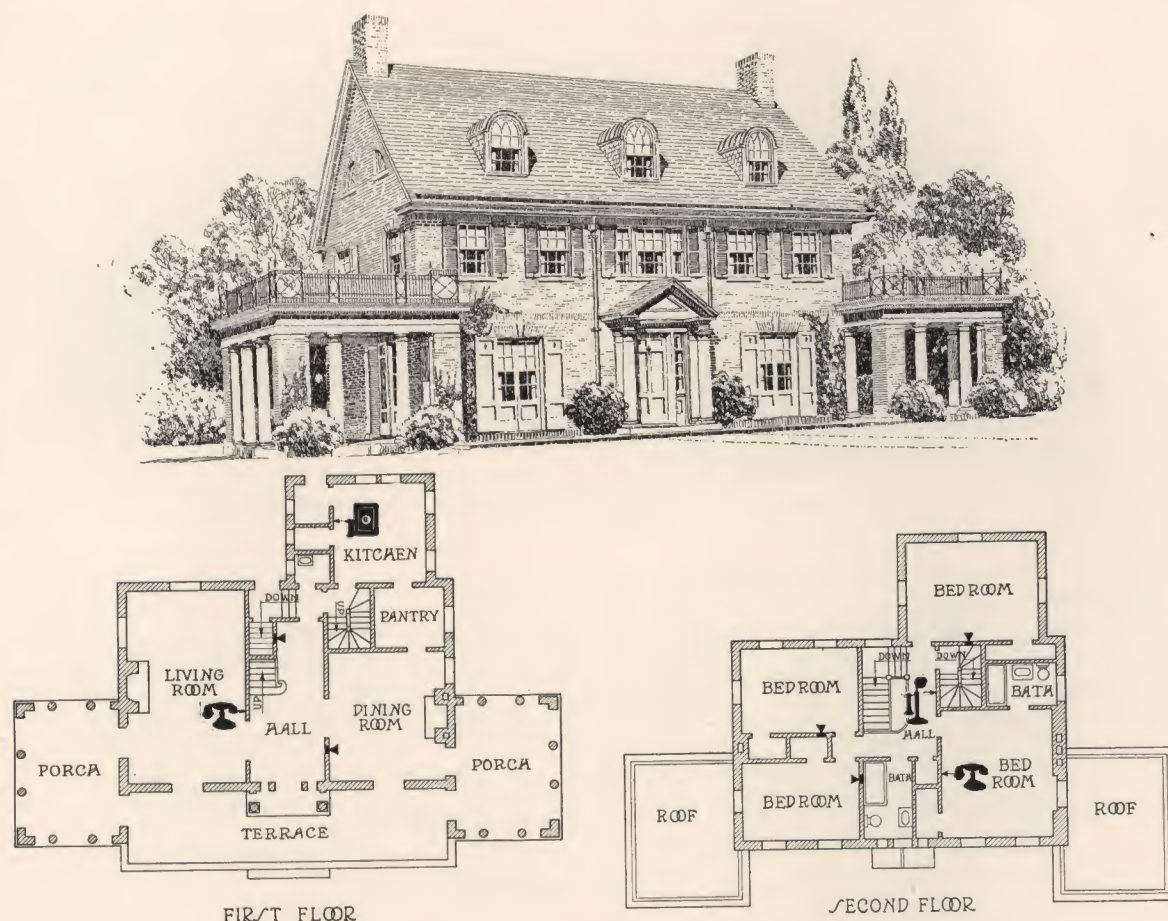


Figure 11.

Telephones in the living room, the kitchen, the master bedroom, and the upstairs hall. Additional telephone outlets in the downstairs hall, in the dining room and in the three other bedrooms are suggested.

The living room location for a telephone seems appropriate from the standpoint of comfort; the kitchen telephone is needed in the conduct of household affairs, such as marketing; the bedroom telephone provides convenience to its occupants; the other upstairs telephone is for the remainder of the household and obviates the possibility of intrusion on occupants of the master bedroom when the service is needed. In many homes of this type servants' quarters are located on the third floor, where a telephone should be located for their use, particularly in answering incoming calls when the family is not at home. The basement and garage might also be provided with telephones for convenience to members of the household and others.

It is suggested that the other three bedrooms on the second floor be provided with telephone outlets which will care for any rearrangements of the upstairs telephones which may at any time seem advisable, and for such additions to telephone comfort as conditions may indicate. It may be found a great convenience to have telephone jacks located at these outlets for use with a portable telephone where occupancy of the room requires its use. Outlets are also suggested in the downstairs hall and in the dining room for use should telephones be desired at those locations.

PLANNING FOR HOME TELEPHONE CONVENIENCES

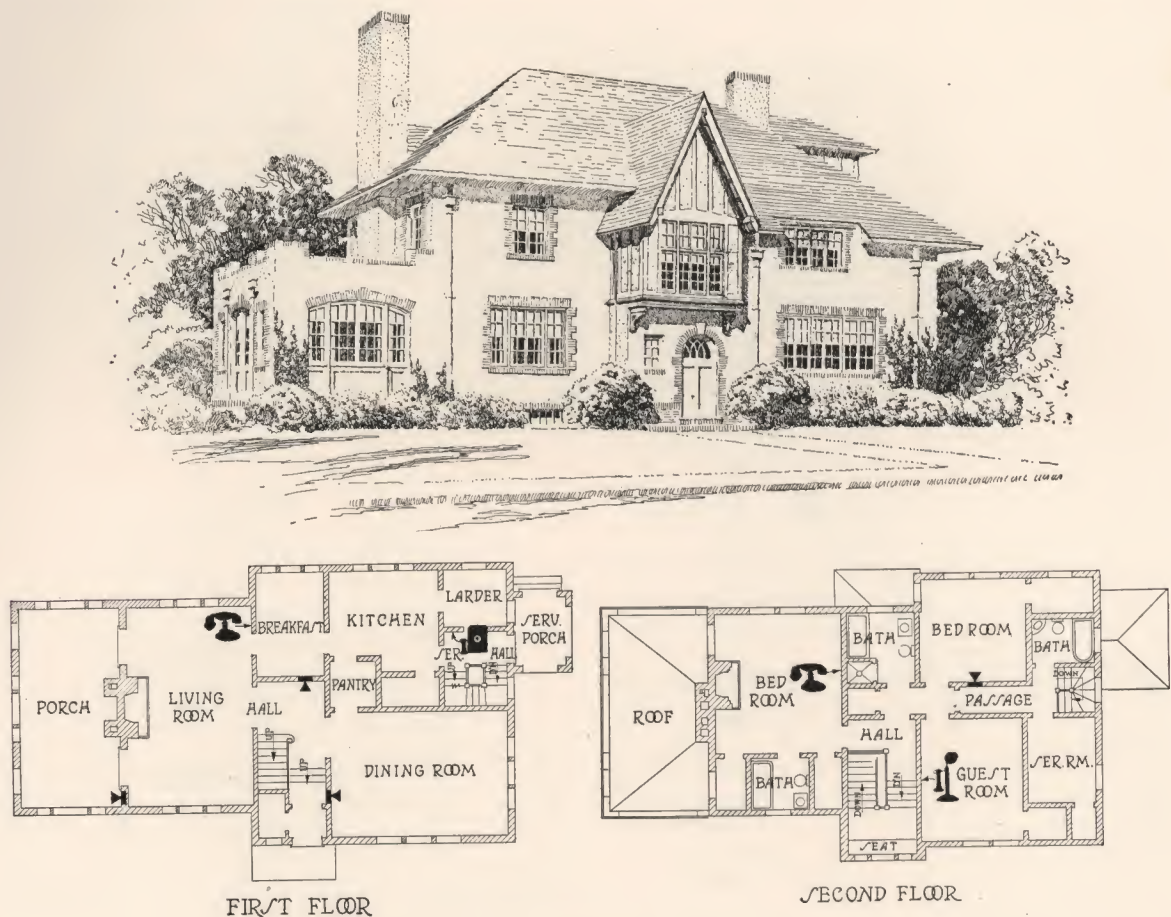


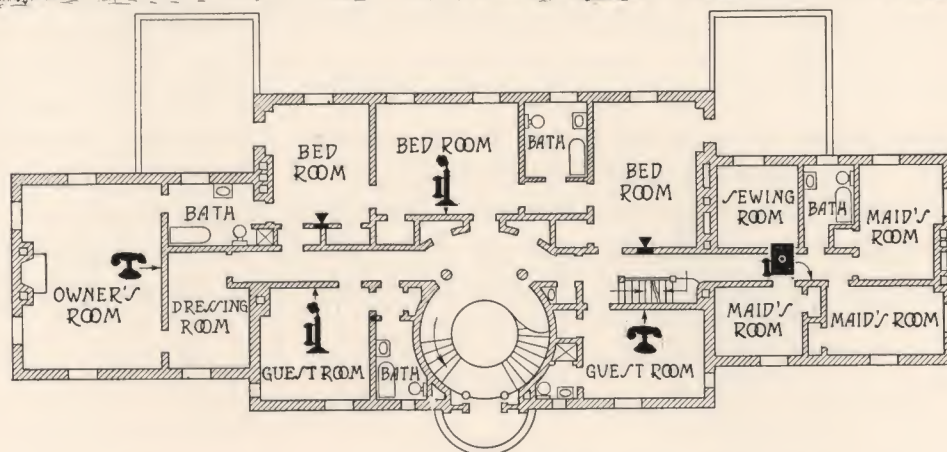
Figure 12.

Telephones in the living room, the service hall, the master bedroom and the guest room. Additional telephone outlets in the downstairs hall, dining room, sun porch, and the rear bedroom are suggested.

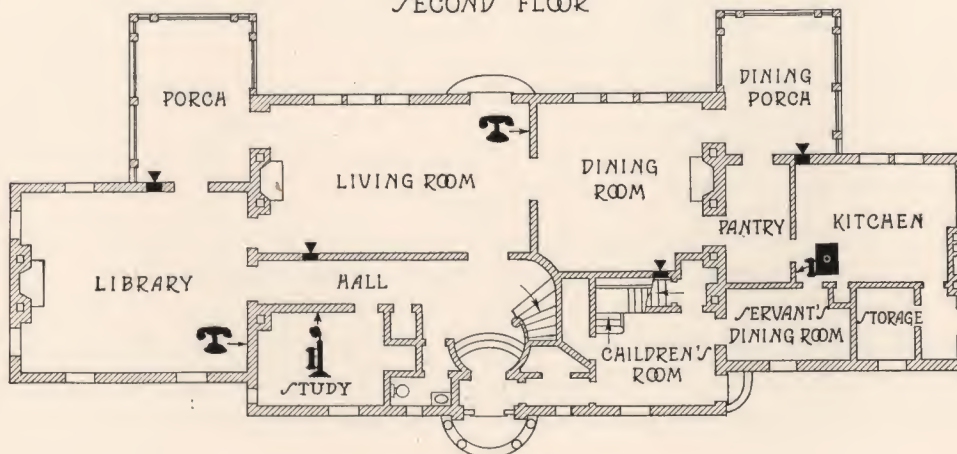
The living room telephone is convenient for the downstairs living quarters; the telephone in the service hall, close to the kitchen, provides for use in the conduct of household business and, being near the rear staircase, is also available to the servant's room upstairs, thus making possible prompt answering of incoming calls both day and night; the telephone in the master bedroom gives a convenient service for protective purposes at night and for other uses; the telephone in the guest room is an important item in providing for the comfort of guests. Telephones in the basement and possibly the garage would also add considerably to the communication conveniences.

Telephone outlets are also suggested in the downstairs hall, the dining room, the porch and the rear bedroom. The provision of genuine telephone comfort in a home of this type would make it highly desirable to equip these telephone outlets with jacks for use with a portable telephone, thus making telephone service readily available in all portions of the house.

PLANNING FOR HOME TELEPHONE CONVENIENCES



SECOND FLOOR



FIRST FLOOR

Figure 13.

Telephones in the living room, library, study, kitchen, owner's bedroom, guest rooms, bedroom and upstairs servants' corridor. Telephone outlets in the living room, dining room, porches, and other bedrooms are suggested.

The telephones in the living room, library and study provide easily accessible service for the downstairs living quarters; the kitchen telephone is available for servants' use in answering calls and making calls in connection with household business; the telephones in the owner's bedroom and the two guest rooms are for the especial convenience of their occupants; the other telephone in the family sleeping quarters, in the center chamber of the three designated as "Bedroom," is at a convenient point for use from these rooms either by grown family members or possibly a nursemaid for younger children; the telephone in the upstairs servants' corridor is available equally from the three maids' rooms and the sewing room, thus facilitating the answering of calls, particularly at night.

The additional telephone outlets are suggested for the provision of such telephones or jacks, for use with portable telephones, as convenience and comfort in a home of this type would dictate.

Undoubtedly a home of this size would require intercommunicating service between the telephones, in addition to connection with the telephone company's central office over one or more lines. Telephones placed in the basement, the garage and perhaps other outlying buildings, connected with such a system, would be available for intercommunication with the telephones in the residence, thus adding to the general convenience of the service. As the facilities required for intercommunicating service are usually quite comprehensive, as has been indicated in Sections 16 to 20, it is most important that owners, engineers, architects and builders confer in all cases with the telephone company regarding the facilities and arrangements before plans for such residences are completed.

Two Family House

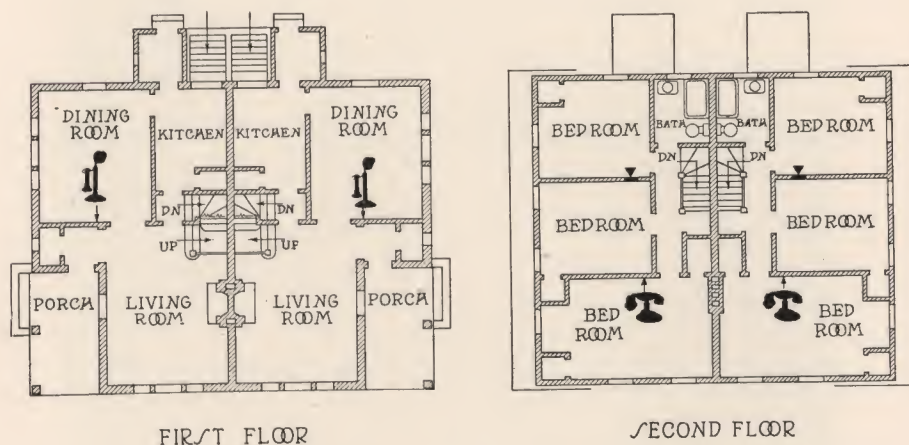
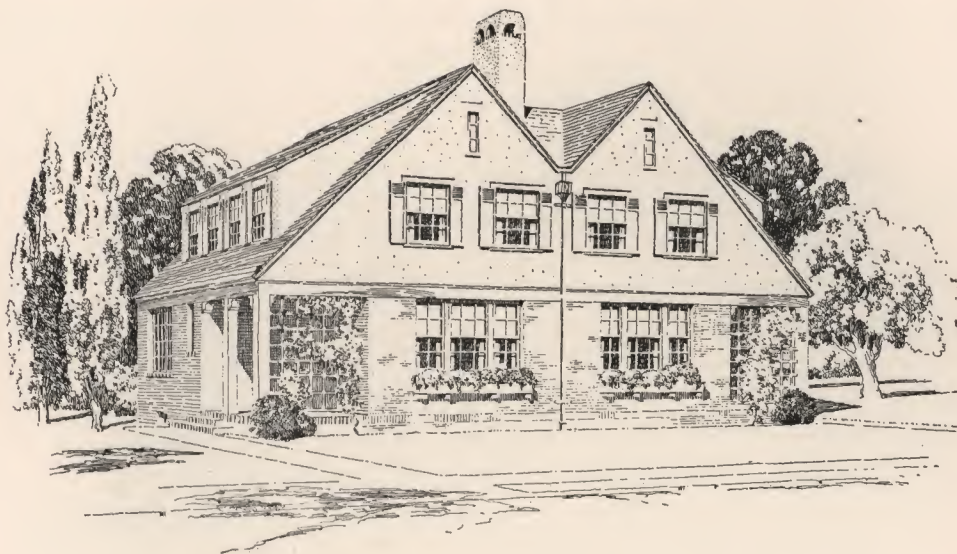


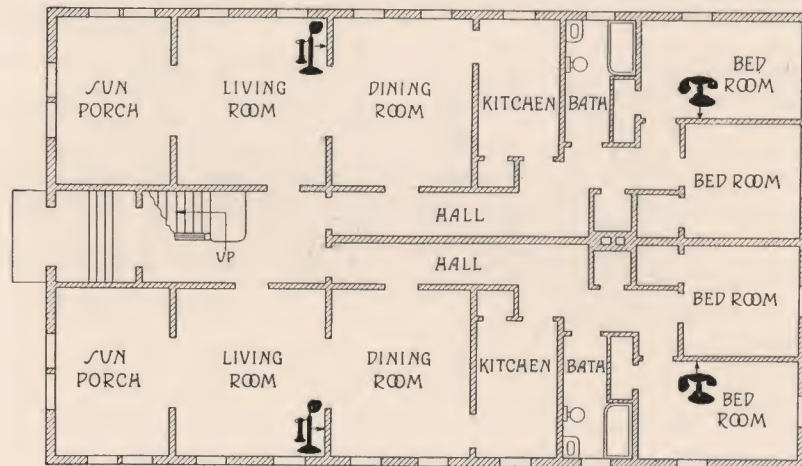
Figure 14.

Telephones in each dining room and each front bedroom. Additional telephone outlets in each rear bedroom are suggested.

The telephone in the dining room, being midway between the living room and the kitchen, is convenient for the downstairs portion of the house; the telephone in the bedroom has the advantages of general convenience upstairs, particularly when its use is required at night.

The additional telephone outlets, which have been placed in the rear bedrooms, might well be provided in order to facilitate the installation of telephone service in these rooms if and when convenience to the occupant makes it desirable. These telephone outlets also provide an alternate location for upstairs telephone service.

Four Family House



FIRST FLOOR

Figure 15.

Telephones in each living room and in each large bedroom.

The telephone in the living room is conveniently located with respect to the front living quarters; the telephone in the bedroom provides general convenience in the rear portion of the apartment, and is accessible during the night when it is needed.

Cabinets for Telephones

12. Bell Box Cabinets. When a telephone is to be placed on a table adjacent to a wall the telephone bell box can be most advantageously placed in a cabinet built in the wall as shown in Figure 16. This cabinet conceals the bell box and must be provided with a grill so that the bell will be heard when it rings.



Figure 16.

Built-in bell box cabinets should preferably be of wood of dimensions as shown in Figure 17, although commercial metal boxes may be used. Metal boxes should be 5 inches deep and have a wood backboard $\frac{7}{8}$ inch thick. Metal covers should be fitted with insulating bushings having an inside diameter of $\frac{3}{8}$ inches. Conduit is run from the protector cabinet to the cabinets and from the cabinets to the other telephone locations.

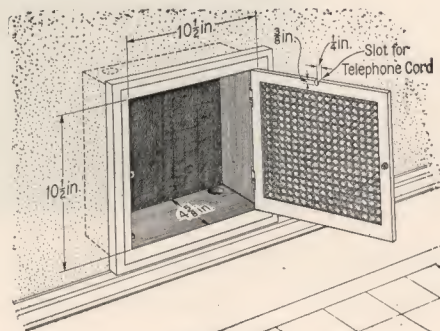


Figure 17.

13. Telephone Cabinets. An alternative arrangement is to place the telephones in built-in cabinets such as illustrated in Figures 18, 19 and 20. In these cabinets the telephone bell box is concealed in the lower part which must be provided with a grill so that the bell will be heard when it rings. Conduit is run from the protector cabinet to the bottom of the telephone cabinet. Conduit also runs from the cabinet to the locations for the other telephones.



Figure 18.

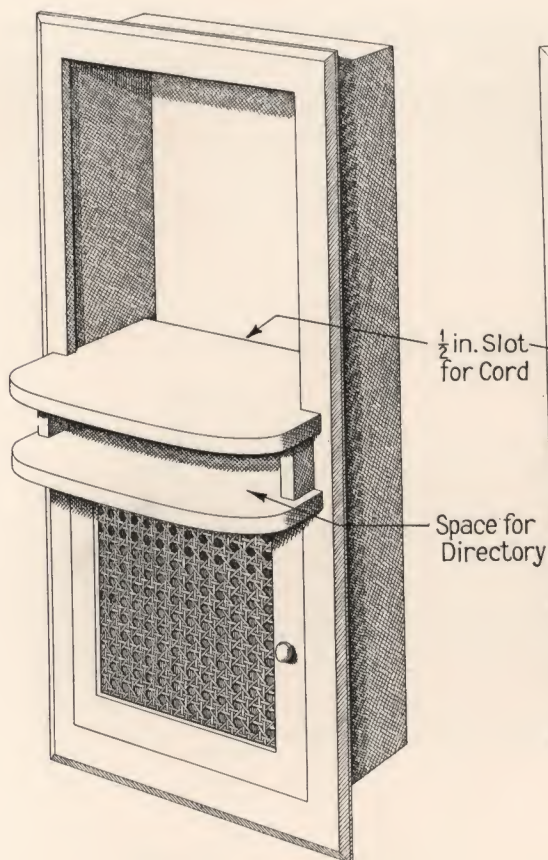


Figure 19.

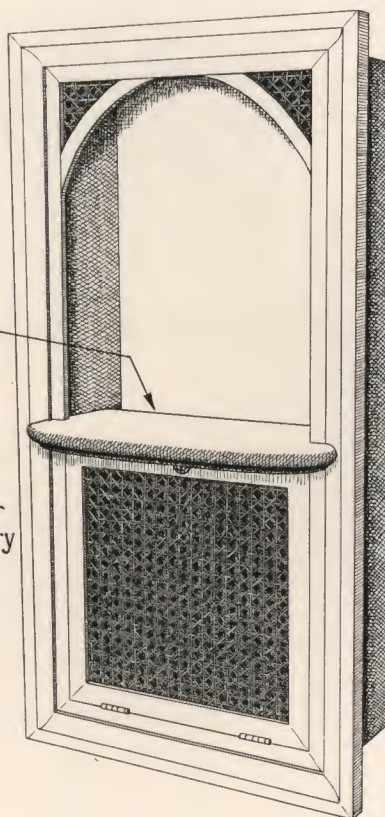


Figure 20.

Commercial telephone cabinets as shown above as well as other types are now on the market. Should it be desired to build the cabinets on the job the dimensions should conform with the following specifications.

Inside dimensions of upper compartment; width 12 inches; height 14 inches; depth 5 inches.

Shelf to extend 5 inches from face of wall if cabinet provides space for directory. Otherwise extend shelf 2 inches from wall. Provide a slot $\frac{1}{2}$ inch wide in rear of shelf between upper and lower compartment, for telephone cord.

Inside dimensions of lower compartment: width 12 inches; height 12 inches; depth 5 inches. Wicker or some other type of open work should be provided on the door so that telephone bell can be heard. Hole should be provided in bottom or side of lower compartment for conduit. If space is provided for telephone directory dimensions should be obtained from telephone company.

The cabinets illustrated above are for the ordinary telephones. Where other apparatus may be associated with the telephone the telephone company will be glad to furnish any necessary information.

PLANNING FOR HOME TELEPHONE CONVENIENCES

14. Outlet Boxes. If a wall box or telephone cabinet is not installed, the run of conduit from the protector cabinet should terminate in an outlet box placed as shown in Figures 21 and 22. The telephone company will then place the telephone bell box over the outlet box.

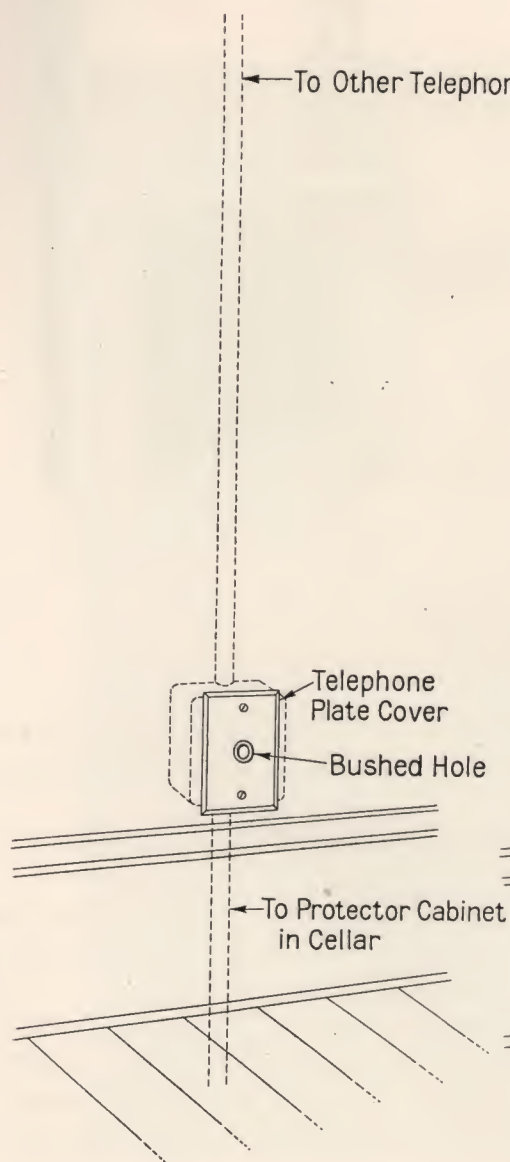


Figure 21.

Outlet box for desk or hand type telephones.

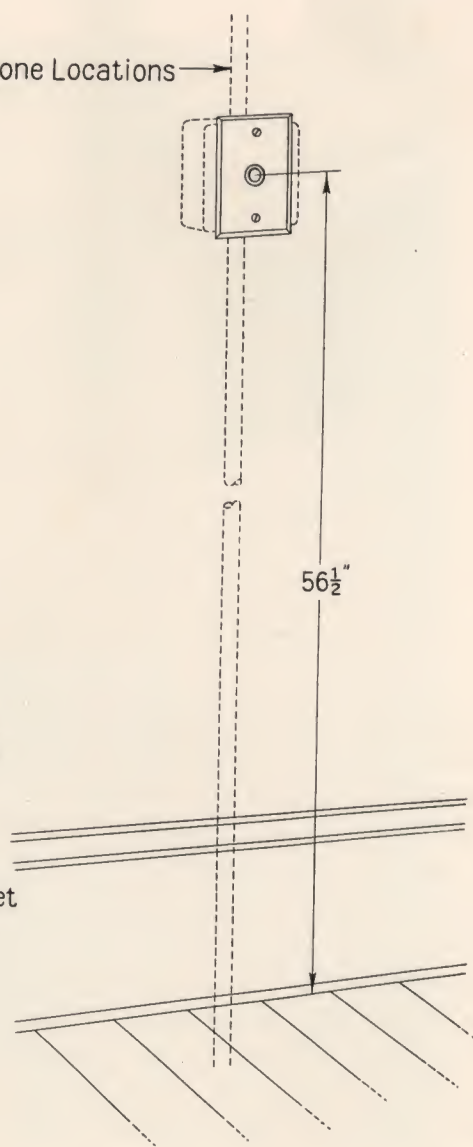


Figure 22.

Outlet box for wall telephones.

Typical Conduit Layouts

15. Conduit Layouts. Figures 23 to 31 illustrate possible conduit layouts for the typical floor plans and telephone locations included in Section 11. These indicate the relation between the service conduit, protector cabinet and conduit between the protector cabinet and the telephones.

Single Family Residences

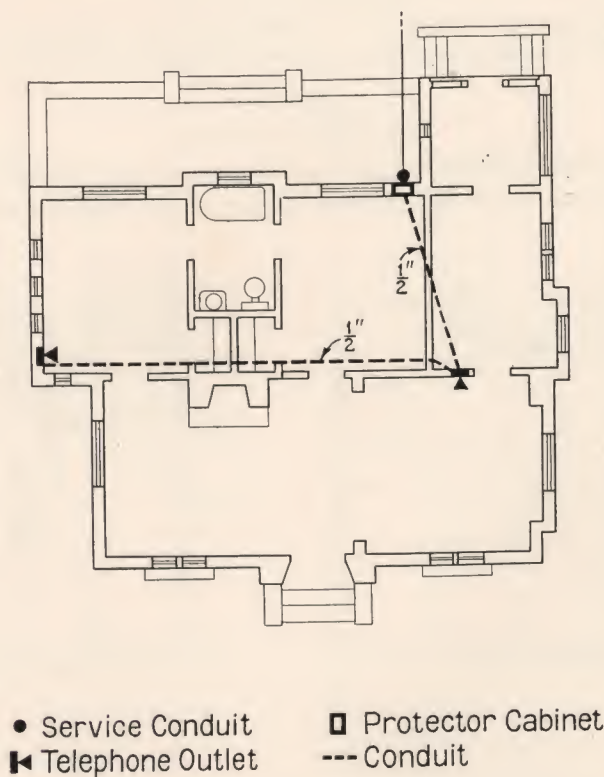


Figure 23.

(See Figure 6, Page 14)

Service conduit and protector cabinet in the wall of the house.
 Conduit is run from the protector cabinet to the telephone outlets.

PLANNING FOR HOME TELEPHONE CONVENIENCES

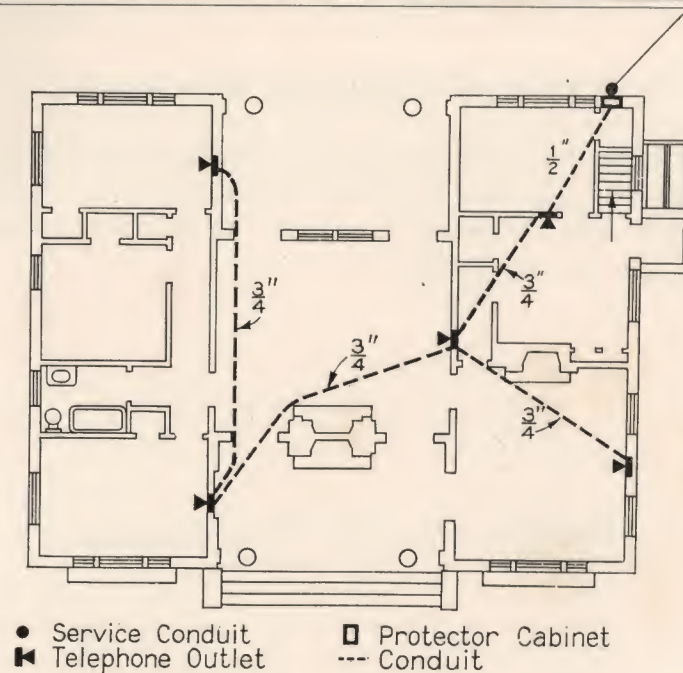


Figure 24.
 (See Figure 7, Page 15)

Service conduit and protector cabinet in the wall of the house.
 Conduit is run from protector cabinet to the telephone outlets.

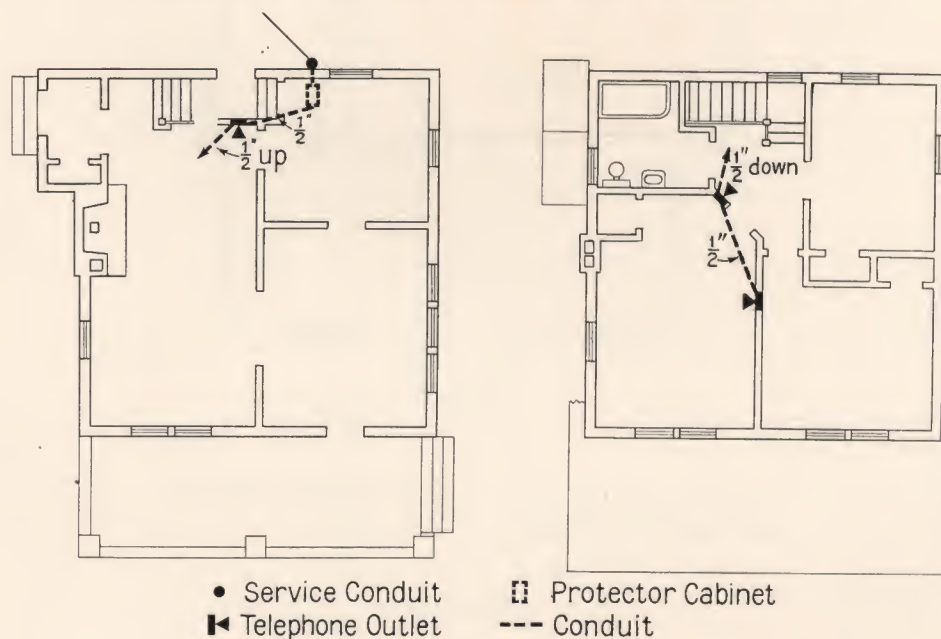


Figure 25.
 (See Figure 8, Page 16)

Service conduit in rear of house connecting to protector cabinet in cellar
 from which conduit runs to telephone outlets.

PLANNING FOR HOME TELEPHONE CONVENIENCES

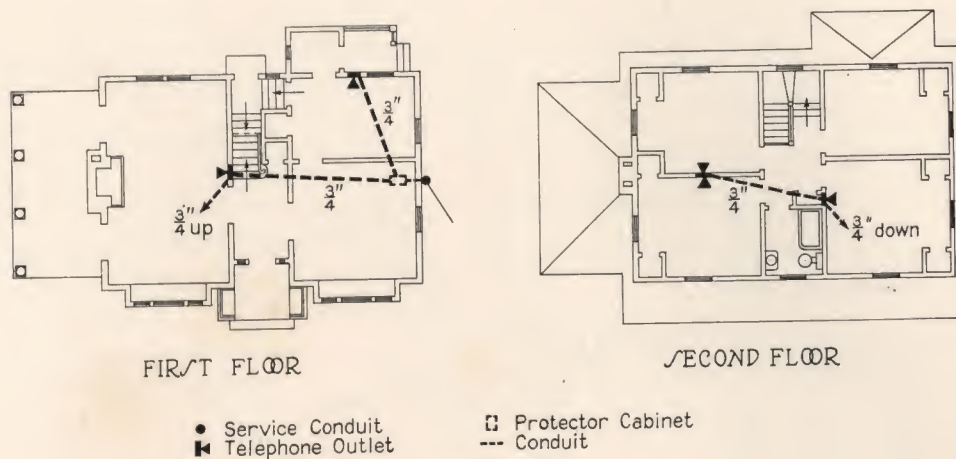


Figure 26.
(See Figure 9, Page 17)

Service conduit on side of house connecting to protector cabinet in cellar from which conduit is run to telephone outlets on first floor. Conduit also connects telephone outlets on first floor with outlets on second floor.

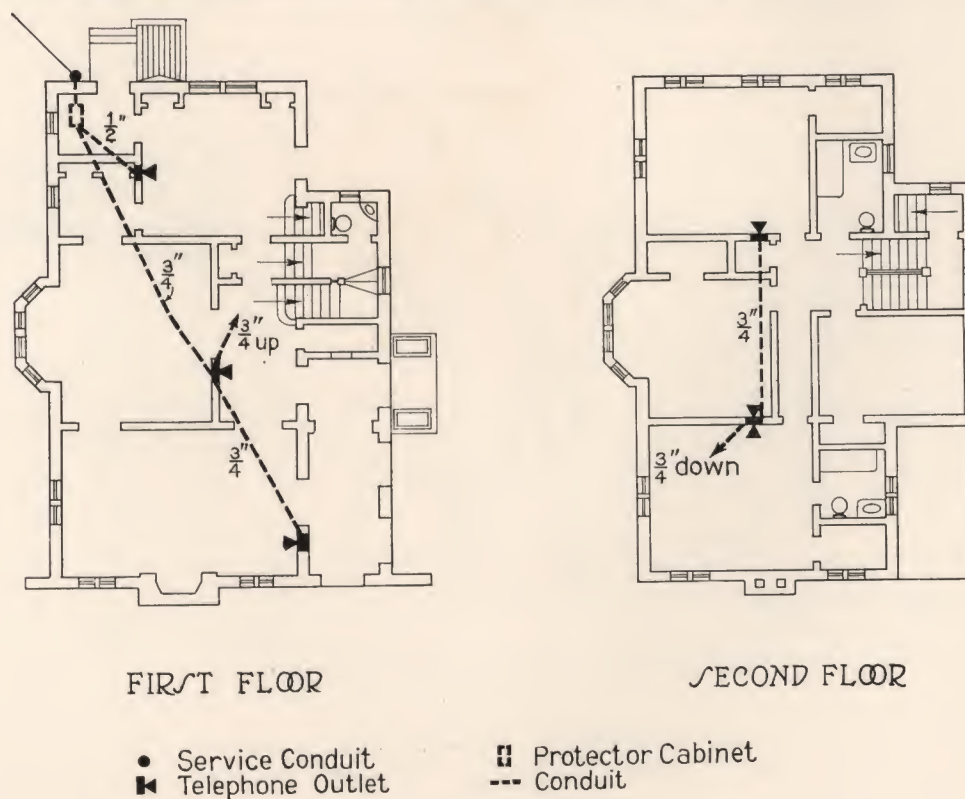


Figure 27.
(See Figure 10, Page 18)

Service conduit in rear of house connecting to protector cabinet in cellar. Conduits are run to telephone outlets on first floor. Conduit also connects telephone outlets on first and second floors.

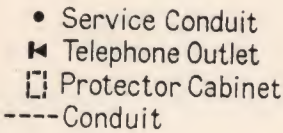


Figure 28.
(See Figure 11, Page 19)

Service conduit in rear of house connecting to protector cabinet in cellar. Conduit is run from the protector cabinet to the telephone outlets.

PLANNING FOR HOME TELEPHONE CONVENIENCES

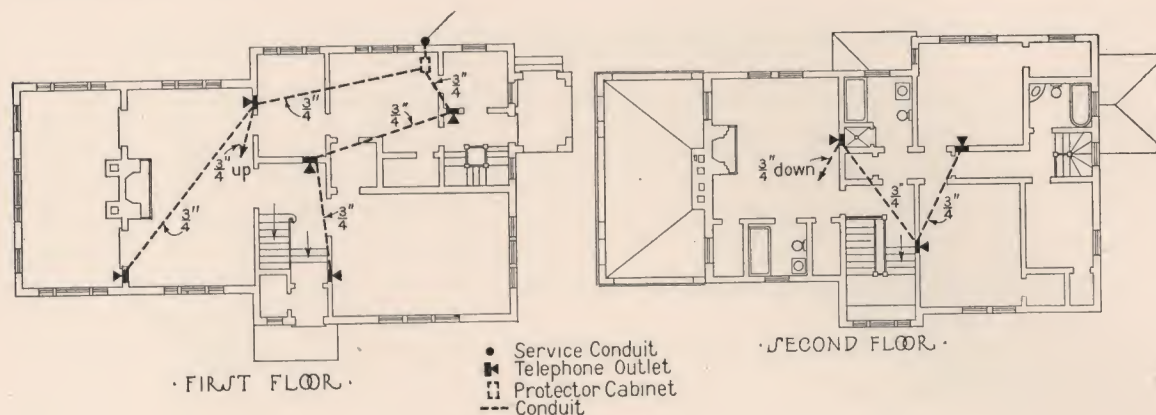


Figure 29.
 (See Figure 12, Page 20.)

Service conduit in rear of house connecting to protector cabinet in cellar. Conduit runs from protector cabinet to telephone outlets in the different rooms.

Two Family House

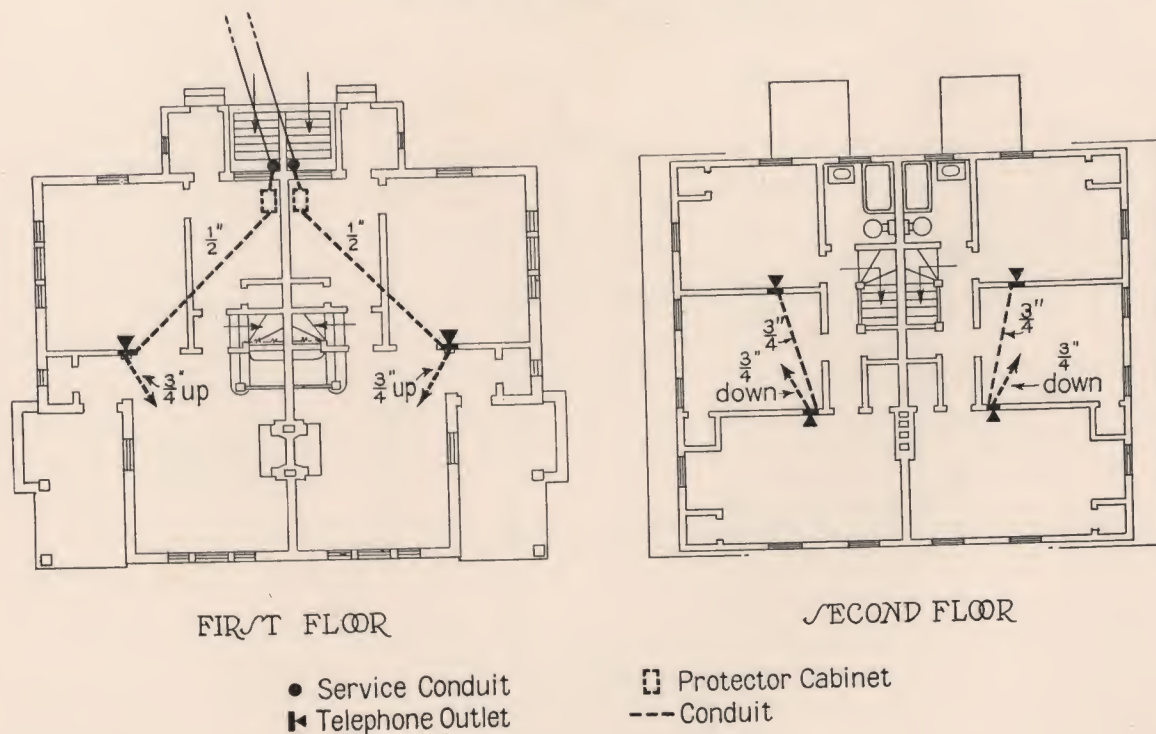
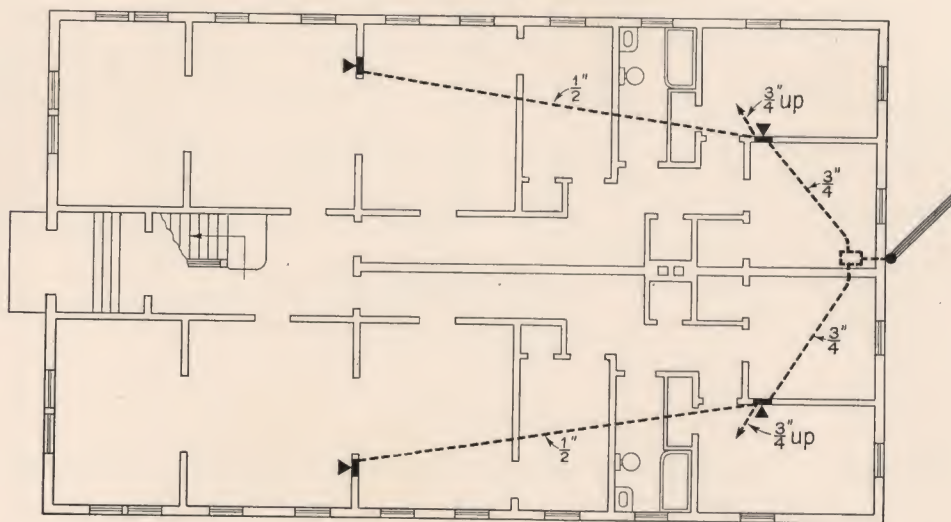


Figure 30.
 (See Figure 14, Page 23.)

Two service conduits in the rear of house connecting to protector cabinets in the cellars. Conduits run from protector cabinets to telephone outlets on first and second floors.

Four Family House



FIRST FLOOR

- Service Conduit
- Telephone Outlet
- Protector Cabinet
- Conduit

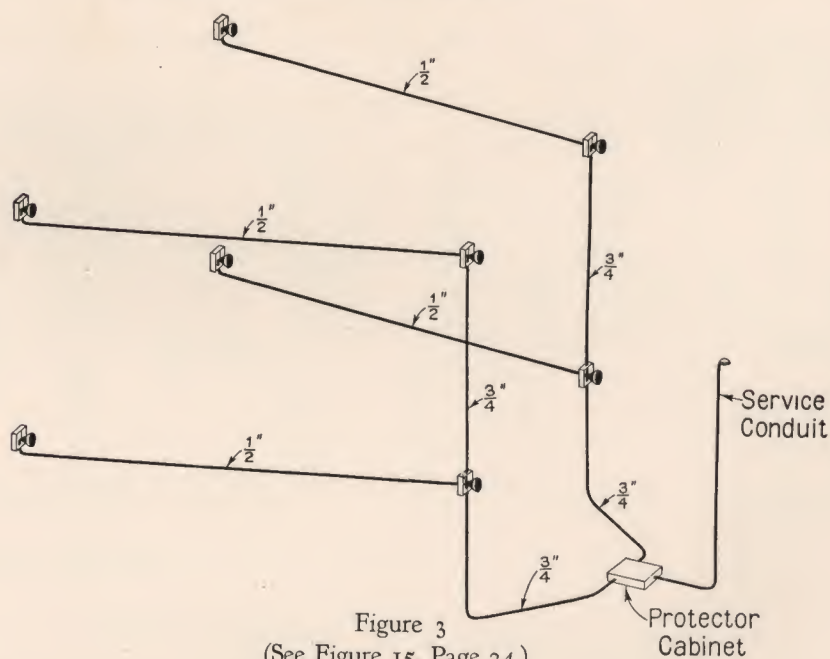


Figure 3
(See Figure 15, Page 24.)

Service conduit in rear of house connecting to common protector cabinet in the cellar. Conduits run from protector cabinet to the telephone outlets in the apartments on both the first and second floors. This same general arrangement may be used for smaller or larger houses of the same general type.

For apartment houses reference should be made to the booklet "Planning for Telephones in Buildings."

Facilities for Intercommunicating Service

16. General. In many residences the convenience of the telephone service is enhanced by the provision of telephone arrangements which make it possible to communicate between all telephones on the premises as well as with the telephone company's central office. The arrangements for this purpose vary, depending on the type of system employed, and it is therefore most important that architects, engineers, builders and owners confer in all cases with the telephone company before plans for residences requiring such service are completed.

Some general information with reference to the facilities and arrangements which may be required is given below in order that architects, engineers, builders and owners may have a general knowledge regarding them.

17. Service Entrances. The facilities for entrances should conform with Sections Nos. 3 and 4 for overhead entrances and Sections Nos. 21 to 43 for underground entrances.

18. Conduit. A conduit system is the most practical method for running the wires and cables required for this service. Installations in country residences differ in many cases from those in city residences in that the latter are usually all in one house whereas with the country residence service may be required not only between points in the main house but also between the main house and outlying buildings such as the superintendent's house, garage, stables and gardener's house. Accordingly, provision may be required for running cables underground or overhead from the main house to the outlying points to be connected.

If cable is to be run underground the conduit should be constructed in accordance with the specifications included in the Appendix except that where cable of more than 5 pairs is required the size of the conduit should be specified by the telephone company.

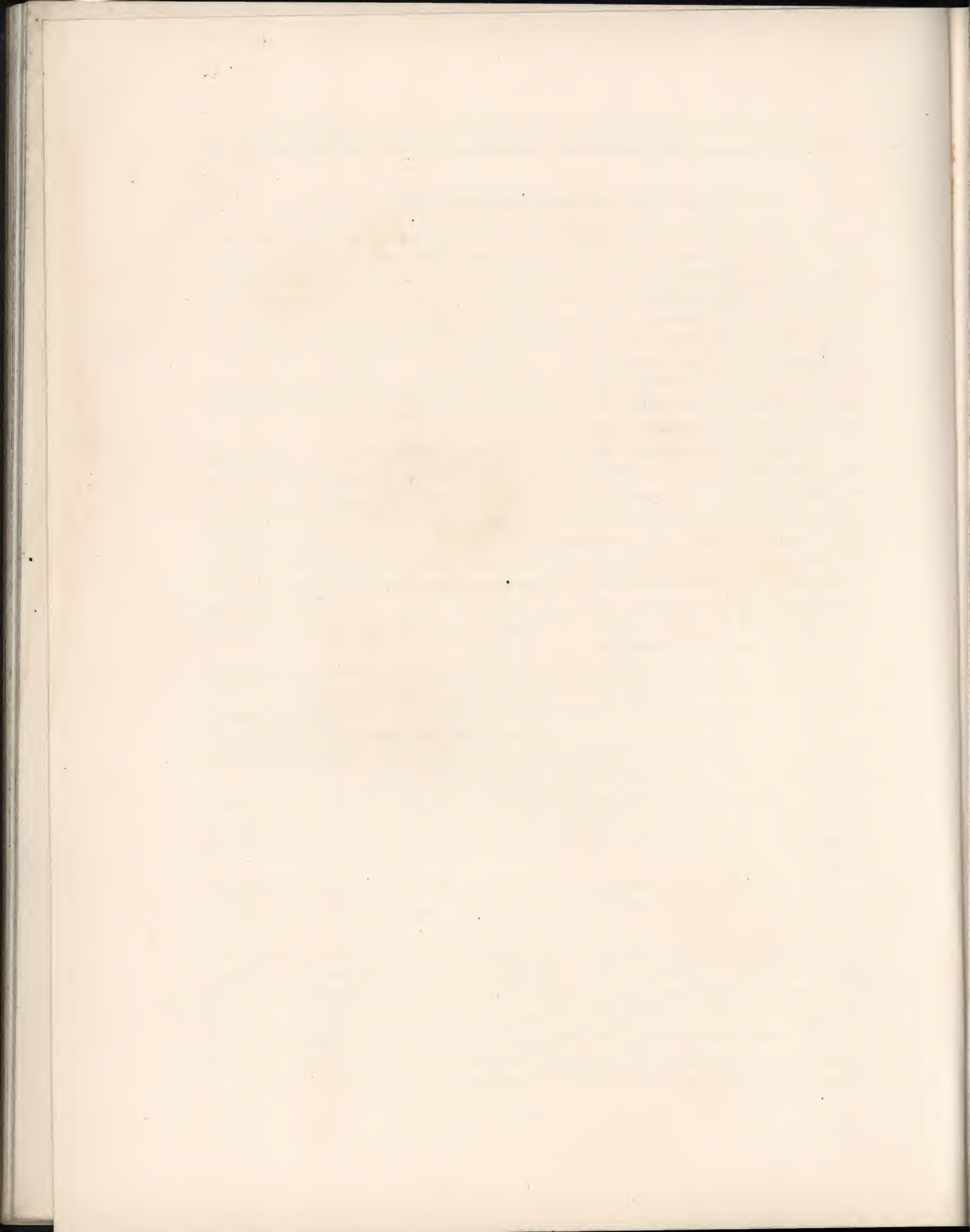
The proper size of conduit in the residence should be determined by the telephone company but in no case should it be less than 1 inch where cable is to be pulled through it. Smaller conduit may be used for some of the auxiliary wiring.

19. Apparatus and Terminal Cabinets. Considerable apparatus is required for operating this service and a suitable cabinet is necessary for its housing. The size of the cabinet depends on the number of telephones and should be specified by the telephone company.

The location of this cabinet in an accessible, light and well ventilated place is important in order that the apparatus may be properly maintained and not be affected by moisture.

Terminal cabinets are usually necessary on each floor to provide for the cross-connection of the wires in the cables. The sizes of these cabinets also vary according to the number of telephones in the system and the number of cables entering the cabinets and should be specified by the telephone company.

20. Outlet Boxes for Flush Telephones. Where flush telephones are required special boxes are placed by the contractor. Dimensions of these boxes vary with the different telephones and should therefore be obtained from the telephone company.



Appendix

Specifications for Underground Service Entrances

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Specifications for Underground Service Entrances

21. General. These specifications cover the methods and materials to be used in the installation of underground service conduits for telephone wires and cables. The specifications do not completely cover installations where the service will require more than five (5) pairs of wires and it is desirable that such installations, if required, be discussed with the telephone company before starting the work.

22. Approved Materials. Iron pipe or iron pipe conduit, fibre duct, creosoted wood duct, and sewer tile are approved for constructing conduit for underground service connections.

Iron pipe or iron pipe conduit may be used under all conditions.

Fibre duct, creosoted wood duct and sewer tile may be used under all conditions except where the fall of the run is toward the house instead of toward the pole or conduit box. Small amounts of water and dirt are likely to enter through the joints in these types of duct and for this reason it is considered inadvisable to use them where the fall of the run is toward the house.

Duct of a material or size other than specified must not be used without the specific approval of the telephone company. The approved materials are listed in the four sections following.

23. Iron Pipe or Iron Pipe Conduit Construction. Use either $1\frac{1}{2}$ inch Wrought Iron Pipe, plain or galvanized or $1\frac{1}{2}$ inch iron pipe conduit, enameled or galvanized. Threaded couplings are required in either case. The inner edges of all iron pipe or duct shall be reamed and all threaded joints shall be sealed with white lead or approved equivalent to make them watertight. Tee and section of pipe for drainage pocket shall be used where required and is shown in Figure 32.

EXTRA PIPE MATERIAL WHERE DRAINAGE POCKET IS REQUIRED

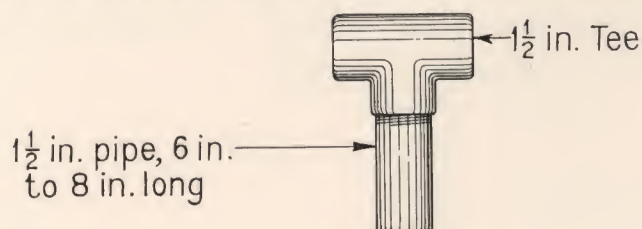


Figure 32.

24. Fibre Duct Construction. Use only types of fibre duct approved by the telephone company. If installed under a highway it shall be encased in 3 inches of 1:4:8 concrete. Otherwise iron pipe shall be used to cross under highway. See Section 39.

2IN. HARRINGTON OR DRIVE JOINT FIBRE DUCT

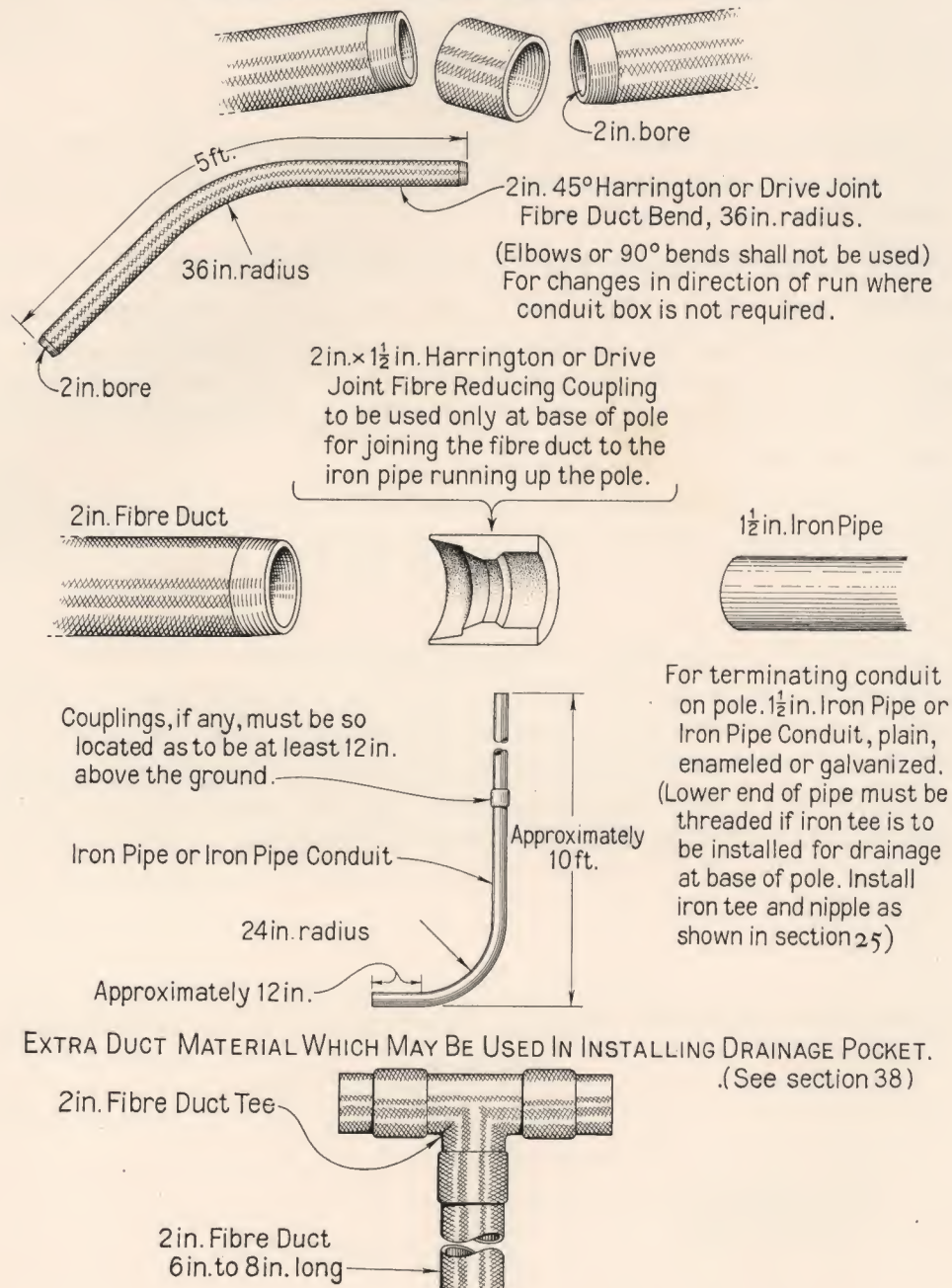


Figure 33.

25. Creosoted Wood Duct Construction.

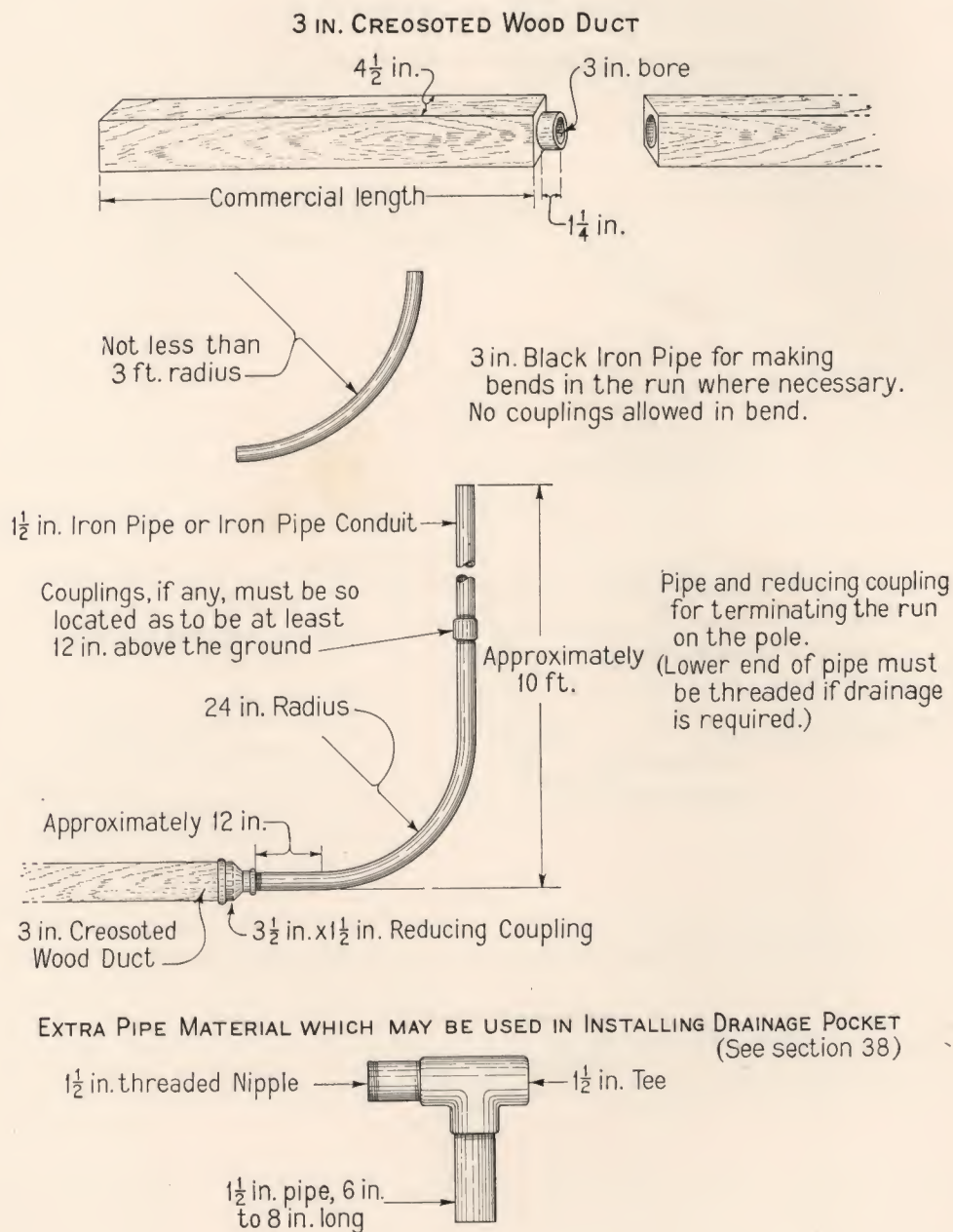
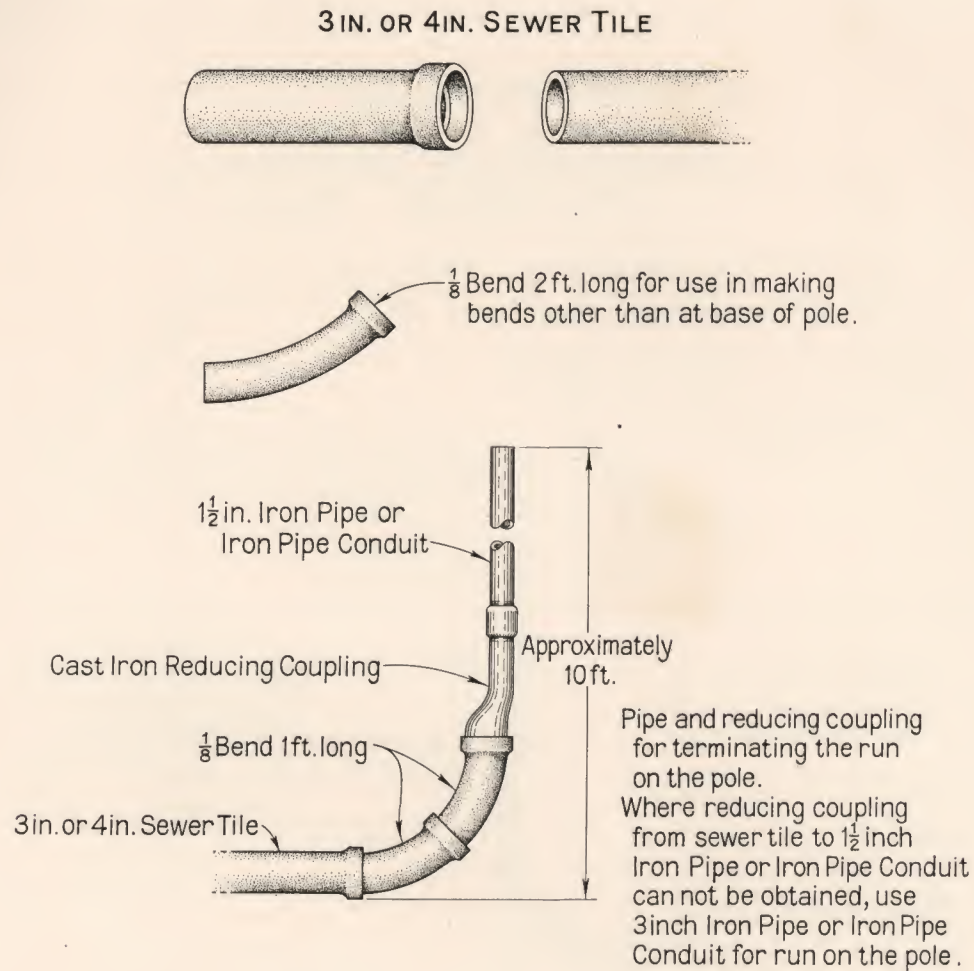


Figure 34

26. Sewer Tile Construction.



EXTRA TILE MATERIAL WHERE DRAINAGE POCKET IS REQUIRED

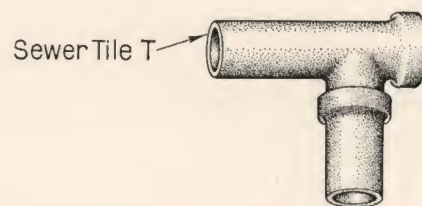


Figure 35.

27. Assignment of Pole. Before doing any work, obtain from the telephone company the designation of the pole from which the underground connection will be run.

28. Location of Entrance. The location of entrance into the building shall be selected with reference to the location of the protector, which the telephone company generally installs for each pair of wires to be brought in. The National Electrical Code requires that the point of entrance and the protector shall be located as close to each other as possible. The conduit shall therefore enter the building at a point suitable for the location of the protector cabinet. See Section 6.

If there is any doubt concerning the location of the entrance, consult the telephone company.

29. Location of Conduit Boxes. Where the run from pole to house will be 350 feet or less, conduit boxes will generally not be required.

Where the run from pole to house is over 350 feet, conduit boxes shall be located as shown in Figure 36.

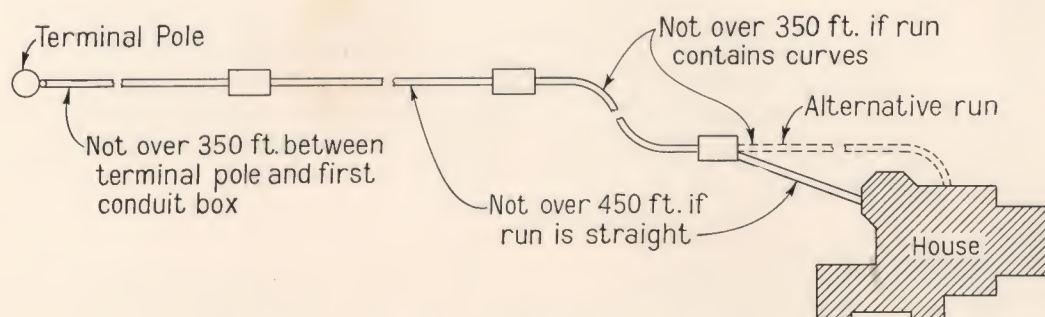


Figure 36.

The sum of the bends in any section from conduit box to conduit box or from conduit box to pole or house (the bend at the base of the terminal pole included) shall not be greater than 2 right angles (180°).

30. Allowable Curves and Bends. No curves or bends sharper than a right angle will be allowed. Where necessary to make a bend sharper than a right angle a conduit box shall be used.

31. Drainage. Water will gradually accumulate in the conduit unless good drainage is provided. If drainage is not provided, and water accumulates in the conduit, the water may freeze in the winter in territories subject to low temperatures and damage the cable to such an extent that a complete failure of the cable will result. In addition to loss of service the replacing of the cable may be expensive because of the difficulty of thawing the conduit in order to remove the damaged cable and place the new one.

PLANNING FOR HOME TELEPHONE CONVENIENCES

It may be found necessary to place a conduit box or a drainage pocket at a point where, either on account of the nature of the soil or because of the contour of the ground, water accumulating in the conduit box or pocket will not drain easily. Such conduit box or drainage pocket will not be accepted by the telephone company unless proper drainage from the box or pocket is provided. Before building a conduit box or drainage pocket at such a point, the contractor should submit to the telephone company, in writing, plans covering the proposed method of drainage and should not proceed with that part of the work until written approval on the part of the telephone company has been obtained.

Drainage pockets are unnecessary in districts where freezing at conduit depth will not occur. Methods of drainage are shown in Figure 37.

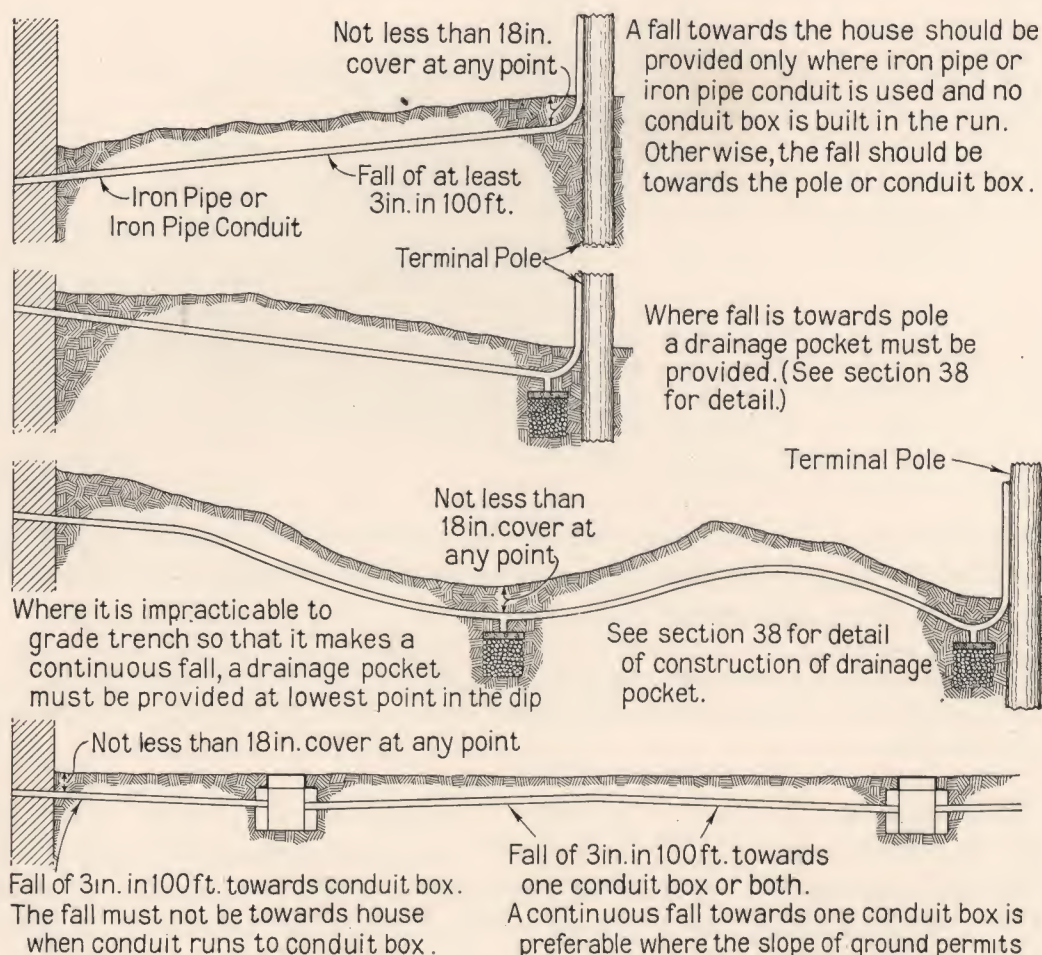


Figure 37.

32. Depth of Trench. Conduit shall be laid in a trench sufficiently deep so that the conduit will have 18 inches of cover. This depth is necessary in order to protect the conduit from mechanical injury due to the digging of the ground in planting shrubs, etc. This depth will also permit of slight changes in grading without disturbing the conduit.

33. Separation from Electric Light Conduits. Telephone conduits shall be separated from electric light or power ducts by not less than 3 inches of concrete, four inches of brick masonry, or 12 inches of well tamped earth.

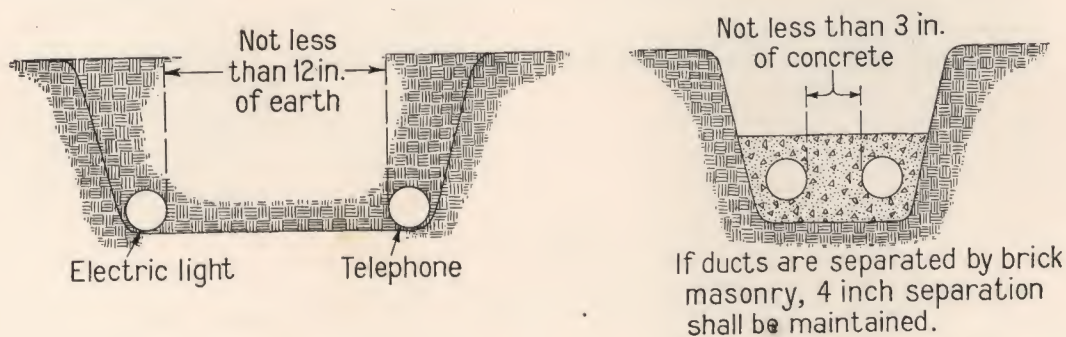


Figure 38.

These clearances apply likewise at crossings of one service over the other.

34. Bends in Run.

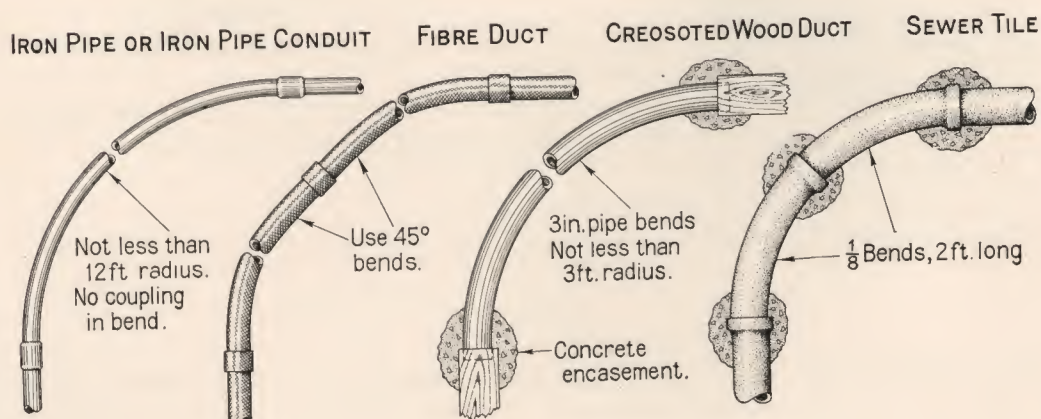


Figure 39.

35. Couplings.

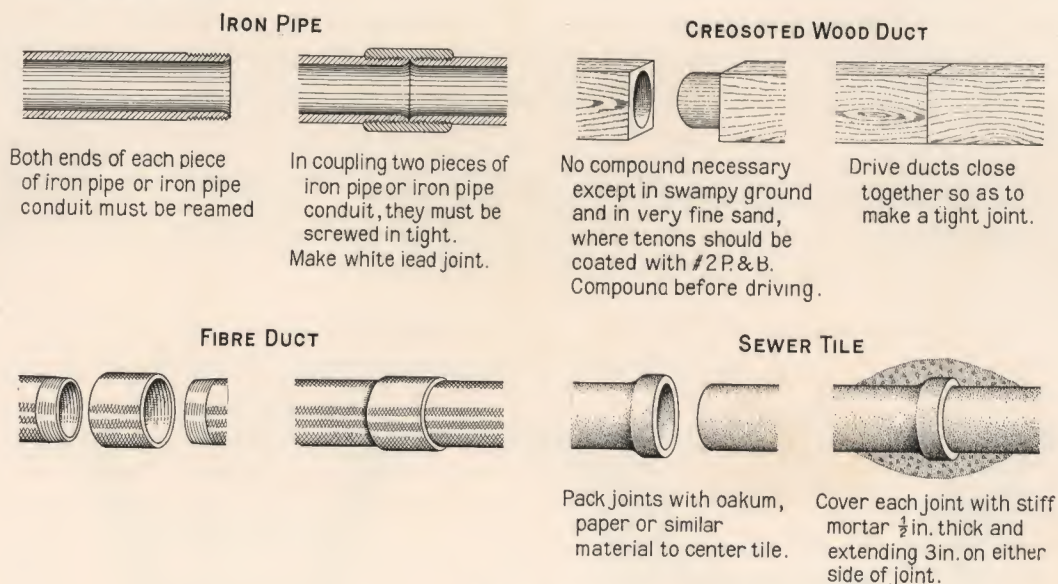


Figure 40.

36. Pulling-in Wire. Wire each conduit while laying same, with a wire not smaller than No. 12 BWG galvanized iron wire, making the wire fast at end of conduit in order to prevent it being pulled out through accident or carelessness.

37. Terminating in Building. At the point where the conduit enters the building it shall be recessed from the surface of the wall and the wall surrounding the conduit shall be rounded to provide an easy turn for the cable.

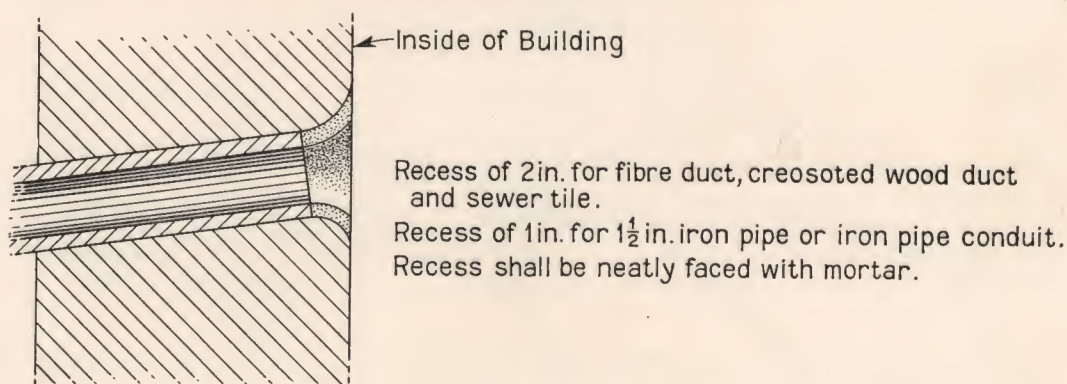


Figure 41.

Seal conduit at the building entrance with a mixture of equal parts of plaster of Paris and sand, or approved equivalent. A cork or round tapered wooden block wrapped with friction tape is satisfactory.

38. Terminating on Pole.

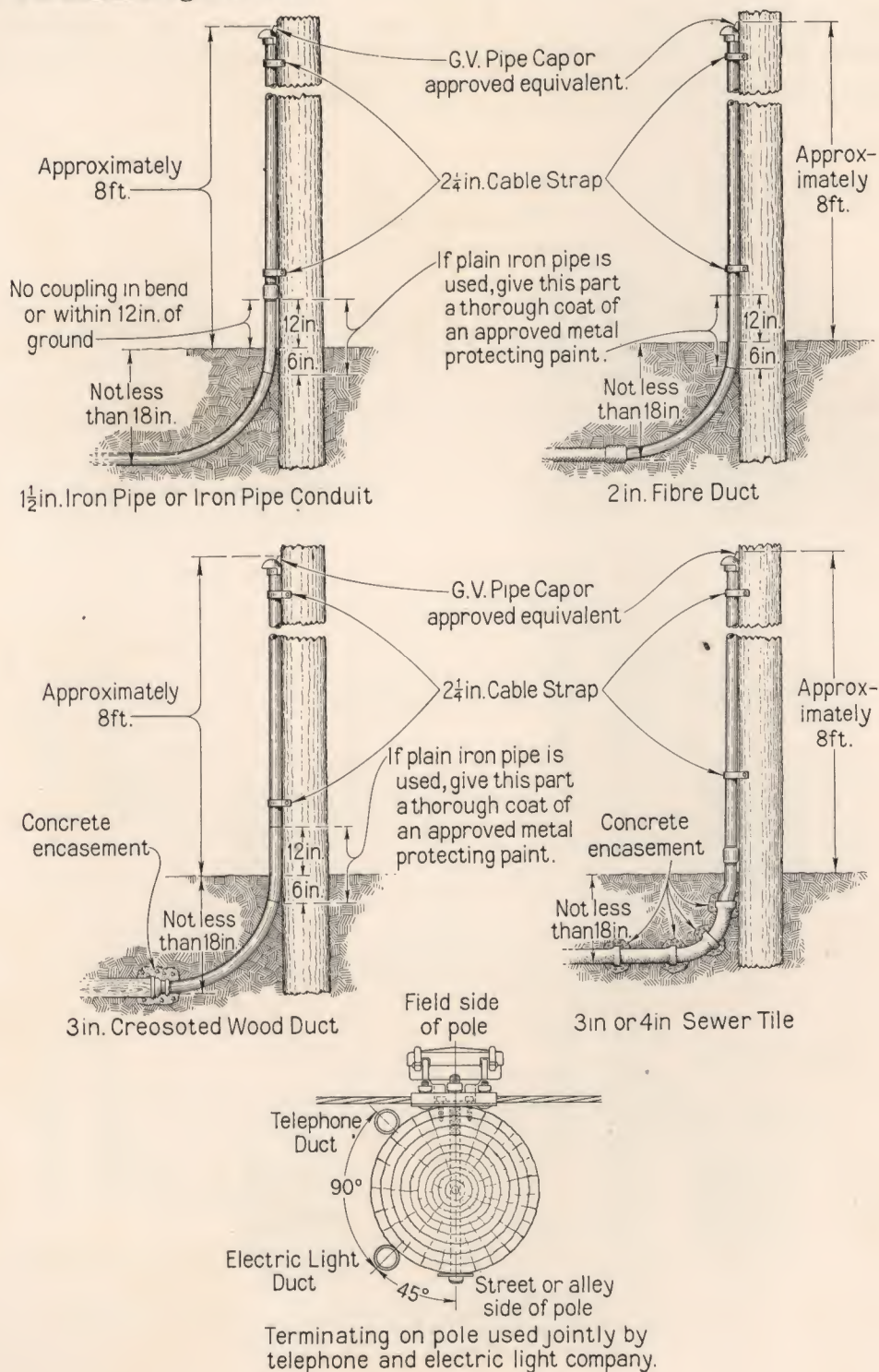


Figure 42.

PLANNING FOR HOME TELEPHONE CONVENIENCES

While it is preferable that the telephone and electric light conduits shall not be terminated on the same pole, if such construction is necessary the telephone conduit shall be placed on the field side of the pole and the electric light conduit on a quadrant on the street or alley side of the pole as shown in Figure 42.

DRAINAGE POCKET

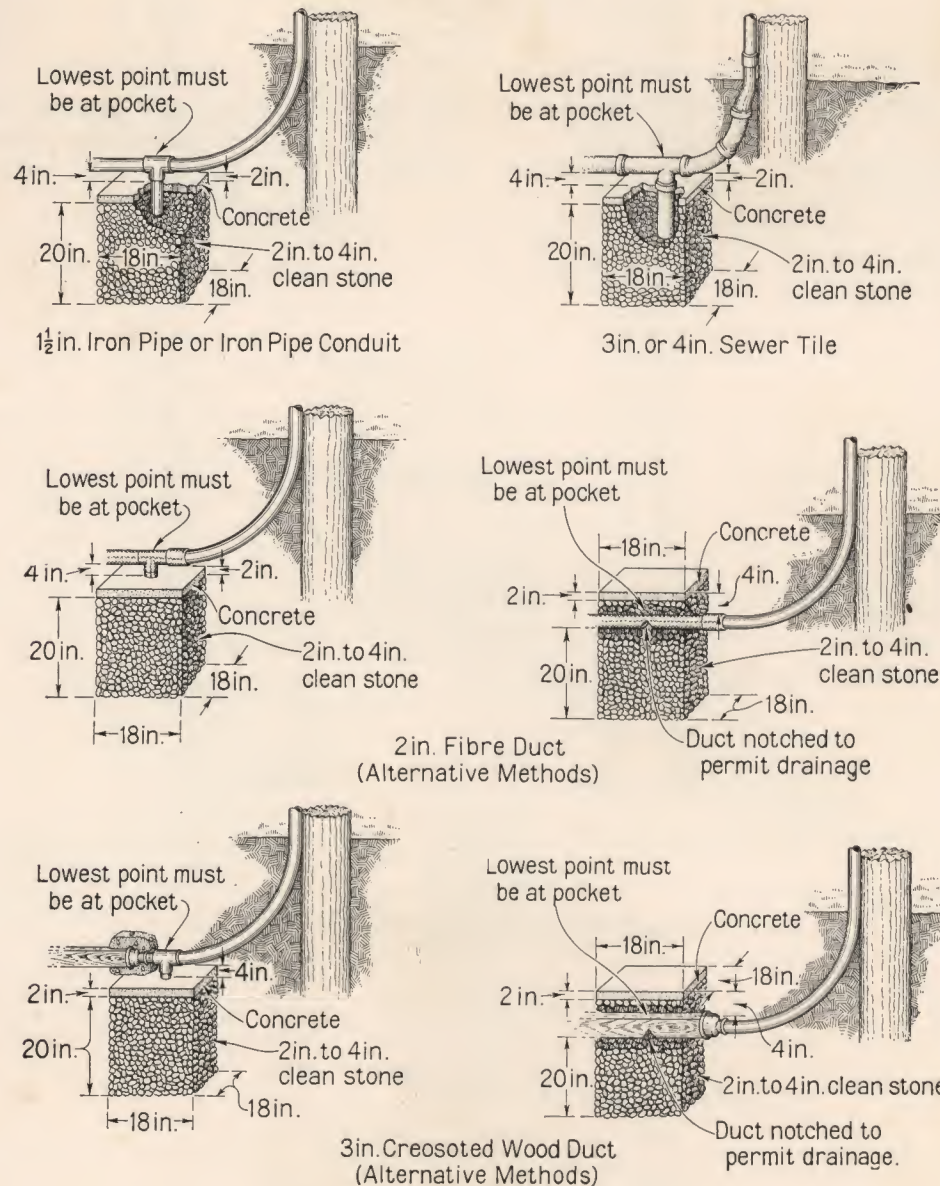


Figure 43.

39. Concrete and Mortar. Mortar shall consist of 1 part Portland cement and 3 parts sand.

Concrete for conduit box walls shall consist of 1 part Portland cement, 3 parts sand and 6 parts broken stone, gravel or slag.

Concrete for trench work shall consist of 1 part Portland cement, 4 parts sand and 8 parts broken stone, gravel or slag.

The sand shall be clean, sharp, coarse and free from dirt and vegetable matter.

Use $\frac{3}{4}$ -inch or smaller broken stone or clean gravel or slag for the concrete. The stone gravel or slag must be hard and free from all vegetable matter and dirt.

40. Conduit Boxes. In general two types of conduit boxes are used in this kind of work: Field Conduit Boxes and Roadway Conduit Boxes. *The construction of the conduit boxes shall in all cases conform to all local rules and regulations.*

In all cases the cover must be readily removable. Conduit boxes with covers that are intended to be buried under lawns or roadways must not be provided for this construction. The floor of the conduit boxes shall be of earth to allow drainage. If paving is desired, the floor should be made of brick or cobble stones laid loosely on the earth without mortar joints.

41. Separation of Telephone and Electric Light Conduit Boxes. Electric light or power wires and telephone wire shall not occupy the same conduit box. Separate conduit boxes may be built with one wall common to both, but each conduit box shall have a separate entrance and there shall be no opening between the two boxes.

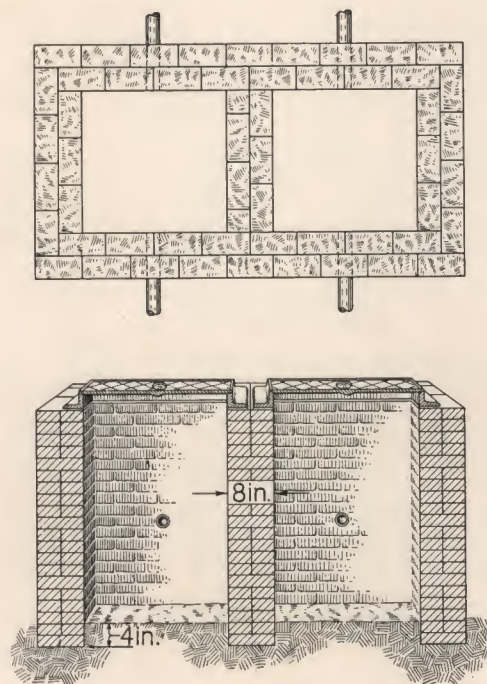


Figure 44.

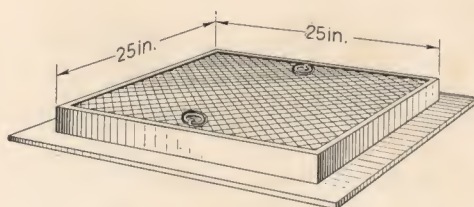


Figure 45.

The diagrams in Figure 46 are intended to show the least dimensions allowable and to suggest desirable methods of construction. The telephone company is not interested in the exact construction employed provided a safe and substantial conduit box is constructed.

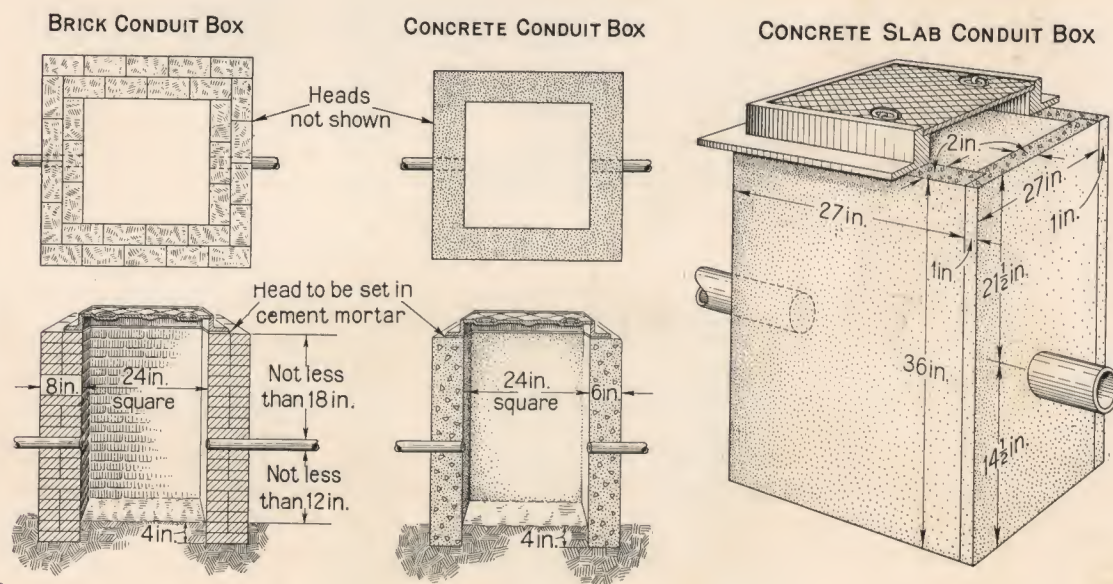


Figure 46.

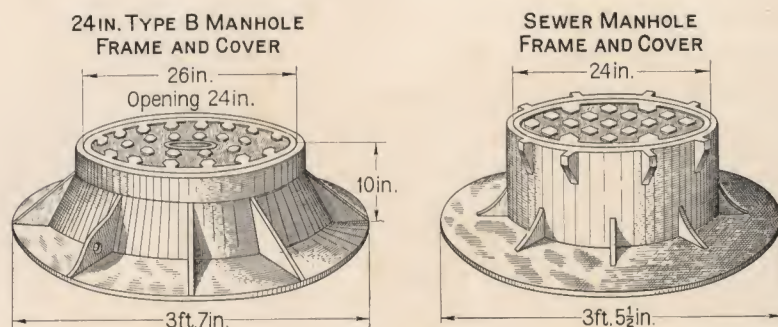


Figure 47.

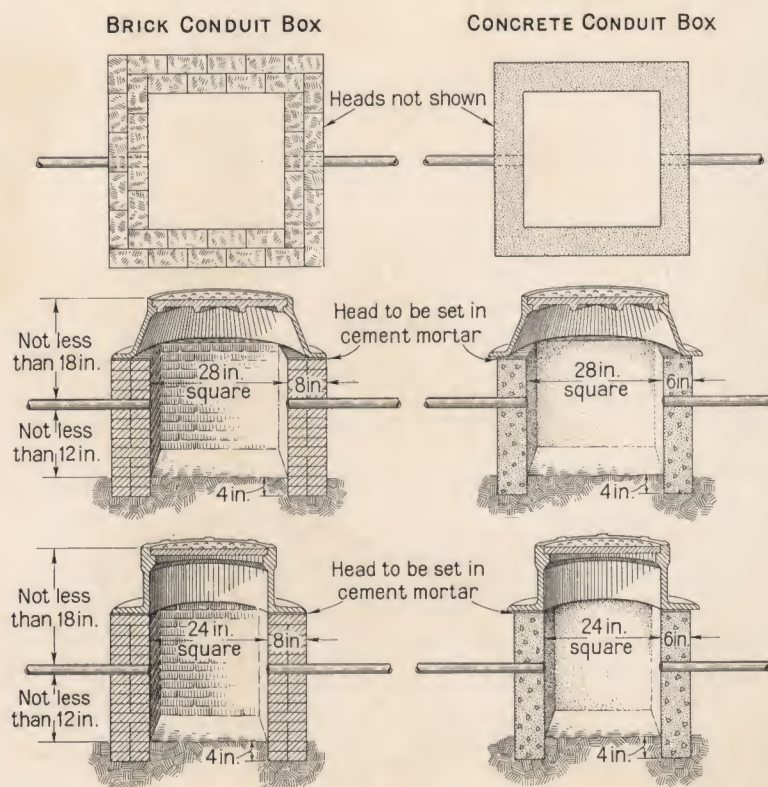


Figure 48.

first set of diagrams shows a conduit box with 24-inch Type B Manhole Frame and Cover and the second shows a conduit box with the Sewer Manhole Frame and Cover.

43. Roadway Conduit Boxes. These are used in cases where the roadway is the most suitable location for the conduit box.

Conduit boxes of this type should be built heavier than the field conduit box and should be provided with an iron frame sufficiently strong to support vehicular traffic.

The frame and cover shall be either of the type commonly used for sewers or of the type used by the telephone company for its service boxes, known as the 24-inch Type B Manhole Frame and Cover. Either a solid or perforated cover may be used. If a perforated cover is used the conduit box should be located so as to minimize the flow of water and mud through the perforations.

As in the case of the field conduit boxes, Figure 48 is intended to suggest desirable methods of construction. The

